



Senate Bill No. 287

REPORT TO THE LEGISLATIVE OVERSIGHT COMMISSION  
ON EDUCATION ACCOUNTABILITY

WEST VIRGINIA  
**RESEARCH**  
TRUST FUND

## RTF Milestones

January 9, 2008	Governor proposes program during State of the State Address
March 8, 2008	Legislation (SB 287) approved by Legislature
April 3, 2008	Legislation signed by Governor
June 23, 2008	RTF Account established, \$50 million deposited
August 25, 2008	Agency-approved Emergency Rules filed
October 15, 2008	Electronic MRS (Match Request System) completed
April 6, 2009	Legislative Rules approved by Legislature (HB 2904)
April 11, 2009	Rules signed by Governor
April 16, 2009	Final Rules filed with Secretary of State
May 18, 2009	Rules effective
May 15, 2009	First Request for Proposals issued for State Colleges and Universities
March-December 2009	Match transfers to both West Virginia University and Marshall University
November 13, 2009	Awards to Concord University and West Liberty University
December 3, 2010	Draft report presented to Policy Commission for approval
January 1, 2010	Statutory Report presented to Legislature and Governor
March 9, 2010	Second Request for Proposals issued for State Colleges and Universities
June - November 2010	Match transfers to West Virginia University
September 2010	Awards to Shepherd University and Fairmont State University
December 2010	Draft report presented to Policy Commission for approval
January 1, 2011	Statutory Report filed with Legislature and Governor
March 12, 2011	Legislation authorized extending RTF distribution date by two years to July 1, 2015.
June 2, 2011	Third Request for Proposals issued for State Colleges and Universities
August 15, 2011	Annual Institutional reports provided by WVU and MU to Policy Commission
September 16, 2011	Award made to West Virginia State University
December 9, 2011	Draft report presented to Policy Commission for approval
January 1, 2012	Statutory Report filed with Legislature and Governor
March 12, 2011	Legislation authorized extending RTF distribution date by two years to July 1, 2015.
June 2, 2011	Third Request for Proposals issued for State Colleges and Universities
August 15, 2011	Annual Institutional reports provided by WVU and MU to Commission
September 16, 2011	Award made to West Virginia State University
December 9, 2011	Draft report presented to Commission for approval
January 1, 2012	Report presented to LOCEA and Governor Tomblin
March 13, 2012	West Virginia submitted final request for RTF match which totaled the \$35 million available to WVU
June 1, 2012	Fourth Request for Proposals issued for State Colleges and Universities No proposals were received
September 21, 2012	Fifth Request for Proposals issued with proposals due December 21, 2012
December 7, 2012	Draft report presented to Commission for approval

## TABLE OF CONTENTS

<b>RTF Milestones</b>	Inside Cover
<b>Report on the Research Trust Fund / Annual Summary 2010-11</b>	3-4
<b>Research Trust Fund Transaction History</b>	4
<b>Total Disbursements to Date</b>	7-8
<b>Investment Earnings to Date</b>	9
<b>Annual Reports</b>	
West Virginia University	11-21
Marshall University	21-28
<b>State Colleges</b>	29
Concord University	
West Liberty University	
Fairmont State University	
Shepherd University	
West Virginia State University	

# REPORT ON THE RESEARCH TRUST FUND

This report on agency level activities to implement and achieve the goals of West Virginia Code §18B-18A-1 et., the Research Trust Fund (RTF) is hereby provided to the Legislative Oversight Commission of Education Accountability (LOCEA). While annual and periodic reports have been provided throughout the first three years of implementation, this report provides a comprehensive assessment in compliance with the authorizing legislation.

## Background

Outlined in Series 48, Research Trust Fund Program, the Commission receives annual reports from institutions and is required to submit a combined annual report on the Research Trust Fund to the Governor and the Legislative Oversight Commission on Education Accountability (LOCEA) by January 1 of each year.

In compliance with this statutory requirement, the Commission is provided a draft annual report for 2012 activities within the Research Trust Fund for review, comment, and approval. The report also includes the most up-to-date figures on the \$50 million account, funds drawn down by Marshall University and West Virginia University, gifts received, endowments established, and reports provided to the Commission by the two universities. In addition, the report includes information on the fund's interest account, which supports competitive research opportunities for the state's other eligible institutions as provided by statute.

The 2012 report is the fourth in a series of annual reports provided by staff since the program's inception in 2008. Contents of the report are provided on the following pages.

## RTF Activities through November 2012

The Commission completed its initial implementation plan during the fall of 2008, which resulted in Series 48 and was subsequently approved by the Legislature during the 2009 regular session. The rule establishes guidelines, procedures, and documentation standards for the distribution of RTF funds. The rule designates the Vice Chancellor for Science and Research as the administrator of the program, under the general direction of the Chancellor and the Commission.

Commission staff created an electronic "Match Request System" (MRS) in 2008 that allows secure transactions for RTF requests made by the universities. All requests, documentation, and invoicing are permanently recorded in files that allow sorting, analysis, and up-to-date balance information. The MRS is cross referenced with institutional records annually to ensure the accuracy for this report.

Required "Research Plans" specified by the legislation and approved by the respective institutional Boards of Governors have been received from both Marshall University and West Virginia University. Both institutional plans are on file at the Commission and are found to be generally compliant with legislative requirements.

The RTF financial account was established in late June 2008 by the State Auditor and made accessible to Commission staff for distribution. This report provides all transaction activities on the RTF to date from its existence.

Interest funds generated by the RTF account have been separately tracked for distribution to state colleges and universities as defined by the Legislature. On May 15, 2009, the Commission released the first competitive request for proposals for RTF interest funds collected on the account specifically for state colleges and universities and the West Virginia School of Osteopathic Medicine in accordance with provisions of West Virginia Code §18B-18A-10 of the code. A second request for proposals was issued on March 9, 2010, a third on June 2, 2011, a fourth on May 30, 2012, and a fifth on September 21, 2012. Proposals for up to \$100,000 each were received from eligible institutions and subsequently reviewed by external peers for program merit. As a result, two awards were issued in 2009, two in 2010, and one in 2011. No applications were received in response to the May 2012 request for proposals and the current request remains open until December 21, 2012.

## Transaction Summary

### Marshall University

- Through 2009, combined funds matched by the RTF and transferred were \$742,100. This represents 4.95 percent of the total funds available to MU.
- In 2010, new gifts of \$136,660 were reported but were not submitted for match. Thus, total transfers in 2010 were zero.
- A total of two endowments were created through 2010.
- In 2011, new gifts of \$8,194,634 were submitted and matched for a total of \$8,936,733.93 or 59.58 percent of available funds.
- In 2012, new gifts of \$2,181,245 were submitted and matched for a total of \$11,117,979 or 74.12 percent of available funds
- To date, \$3,882,021 or 25.89 percent remains available.

### West Virginia University

- Through 2009, combined funds matched were \$3,489,233. This represented 9.97% of the total funds available.
- In 2010, new gifts of \$4,541,851 were submitted and matched for a total \$8,031,086 or 22.95% of available funds.
- A total of 37 endowments were created through 2010.
- In 2011, new gifts of \$13,835,180 were submitted and matched for a total of \$21,866,266 or 62.48% of available funds.
- In 2012, new gifts of \$13,133,736 were submitted and matched, which completed the \$35 million in match funds that were available.

### State Colleges and Universities (Fund Interest Earnings)

- Total "RTF interest" accrued reached \$919,151.68 as of October 22, 2012.
- An award of \$100,000 was made to Concord University on November 13, 2009.
- An award of \$100,000 was made to West Liberty University on November 13, 2009.
- An award of \$100,000 was made to Fairmont State University on September 17, 2010.
- An award of \$99,892.50 was made to Shepherd University on September 17, 2010.
- An award of \$100,000 was made to West Virginia State University on September 16, 2011.
- Of the commitments totaling \$499,892.50 to state colleges and universities, \$254,241 has been matched and withdrawn by the institutions.
- The current cash balance in the "RTF interest" account is \$477,062.

### Combined Disbursements

- Total combined distributions from the RTF to date are \$46,372,220 or 92.74% of the total fund.
- Of this amount, \$15,435,197 was distributed during 2012 and includes \$140,672 disbursed from the interest account for state college participants.
- RTF current account balance is \$3,882,021 on the principal account and \$477,062 in the interest account for a total balance of \$4,359,083.
- Institutions recently provided updates on their respective fundraising activities that are in agreement with this total.

### Plans for 2013

- A sixth state college and university competition is planned for Spring 2013 to further disburse RTF interest funds.
- A plan is in place for pledge gifts to ensure that all such donor pledges are completed by July 1, 2015, the legislatively defined compliance date (as amended).
- Annual meetings with institutional leaders and foundations are planned.

### Summary Distribution History

#### 2009 Approved Requests Summary as of December 14, 2009

2009	Gifts	Pledges	Total Gifts	Total Pledges	Total Request
Marshall	15	4	\$603,100	\$139,000	\$742,100
WVU	104	14	\$2,214,907	\$1,274,326	\$3,489,233
<b>Combined</b>	<b>119</b>	<b>18</b>	<b>\$2,818,007</b>	<b>\$1,413,326</b>	<b>\$4,231,333</b>

#### 2010 Approved Requests Summary as of November 30, 2010

2010	Gifts	Pledges	Total Gifts	Total Pledges	Total Request
Marshall	2	0	\$136,660	\$0	\$136,660
WVU	134	64	\$3,061,857	\$1,480,000	\$4,541,851
<b>Combined</b>	<b>136</b>	<b>64</b>	<b>\$3,198,517</b>	<b>\$1,480,000</b>	<b>\$4,541,851</b>

#### 2011 Approved Requests Summary as of November 11, 2011

2011	Gifts	Pledges	Total Gifts	Total Pledges	Total Request
MU	11	2	\$3,069,634	\$5,125,000	\$8,194,634
WVU	61	12	\$10,586,046	\$3,249,134	\$13,835,180
FSU	2	0	\$9,250	0	\$9,250
SU	1	0	\$39,307	0	\$39,307
WLU	1	0	\$32,130	0	\$32,130
<b>Combined</b>	<b>76</b>	<b>14</b>	<b>\$13,736,367</b>	<b>\$8,374,134</b>	<b>\$22,110,501</b>

#### 2012 Approved Requests Summary as of November 30, 2012

2012	Gifts	Pledges	Total Gifts	Total Pledges	Total Request
MU	8	2	\$2,080,245	\$100,000	\$2,181,245
WVU	13	4	\$2,096,236	\$11,037,500	\$13,133,736
CU	1	0	\$23,500	0	\$23,500
FSU	5	0	\$17,172	0	\$17,712
SU	2	0	\$53,194	0	\$53,194
WVSU	1	0	\$100,000	0	\$100,000
<b>Combined</b>	<b>30</b>	<b>6</b>	<b>\$4,391,669</b>	<b>\$11,137,500</b>	<b>\$15,509,387</b>

#### Total Approved Transfers to Date

**\$46,372,220**

## Combined Transaction History 2010-2011

Date	Recipient	Fund	Amount	Pledge/Gift
11/17/10	WVU	Grace C. Clements Speech Pathology and Audiology Research Endowment	25,534	G
11/17/10	WVU	Branson-Maddrell Endowed Professorship in Orthodontics	75,505	G
11/17/10	WVU	Raymond Brooks Vanscoy Cancer Research Endowment	8,505	G
11/17/10	WVU	Virginia Oil and Gas Research Endowment for PNGE	50,000	G
11/17/10	WVU	Darrell and Diane Williams Research Endowment in the Department of Petroleum and Natural Gas Engineering (PNGE)	50,000	G
11/17/10	WVU	James P. Boland, M.D., Department of Surgery Endowed Research Fund	98,808	G
11/17/10	WVU	Norma Mae Huggins Cancer Research Endowment	97,965	G
12/20/10	WVU	E. Jane Martin Research Doctorate Fund	25,000	G
12/20/10	WVU	Norma Mae Huggins Cancer Research Endowment	13,202	G
12/20/10	WVU	The Martha Gaines and Russell Wehrle Memorial Foundation Pediatric Research Endowment	50,000	P
12/22/10	MU	Named Endowed Professorship in Dementia Research	1,000,000	G
12/22/10	MU	Rahall Transportation Institute	50,000	G
12/22/10	MU	Marshall Institute for Interdisciplinary Research	114,646	G
1/5/11	MU	J.H. Fletcher and Company Endowment for Research in Mechanical Engineering	125,000	P
1/19/11	SU	Undergraduate Research and Experiments in Robotics-Based Accomplishments for STEM (URERAS)	39,307	G
2/10/11	FSU	Fairmont State University Foundation	250	G
2/10/11	FSU	Fairmont State University Foundation	9,000	G
2/21/11	WVU	WVU Ruby Scholars Graduate Research Fellowship	4,600,000	G
2/21/11	WVU	John T. and June R. Chambers Chair of Oncology Research	750,000	P
2/21/11	WVU	The Michael Baker Corporation Endowment In Civil and Environmental Engineering	25,000	G
2/21/11	WVU	Christopher Cline Chair in Orthopedic Surgery	2,000,000	G
2/21/11	WVU	Frederick P. and Joan C. Stamp Cancer Research Endowment	104,701	G
2/21/11	WVU	Raymond Brooks Vanscoy Cancer Research Endowment	8,505	G
2/21/11	WVU	Badzek Family Endowment for Nursing Research	100	G
2/21/11	WVU	Grace C. Clements Speech Pathology and Audiology Research Endowment	5,000	G
2/21/11	WVU	James A. Kent Endowment for Biomedical Engineering	4,500	G
2/21/11	WVU	James P. Boland, M.D., Department of Surgery Endowed Research Fund	18,801	G
2/21/11	WVU	James A. & Ruby Romano Department of Civil and Environmental Engineering Endowment	17,187	G
2/21/11	WVU	Bowlby Wood Science Graduate Research Fellowship	492	G
4/8/11	WVU	Grace C. Clements Speech Pathology and Audiology Research Endowment	3,677	G
4/11/11	WVU	James Bergen and Randy Moneith Anderson Endowed Scholarship in Mechanical and Aerospace Engineering	25,000	G
4/11/11	WVU	William "Bill" Closser Memorial Electrical Engineering Scholarship	25,000	P
4/11/11	WVU	Alpha Natural Resources Endowment for Energy Research	225,000	P
4/11/11	WVU	Morton Scholarship	98,498	G
4/11/11	WVU	Preservati Cancer Research Endowment	150,000	G
4/11/11	WVU	James P. Boland, M.D., Department of Surgery Endowed Research Fund	624	G
4/11/11	WVU	James A. Kent Endowment for Biomedical Engineering	1,000	G
4/11/11	WVU	Badzek Family Endowment for Nursing Research	885	G
4/11/11	WVU	Branson-Maddrell Endowed Professorship in Orthodontics	91,942	G
4/11/11	WVU	Norma Mae Huggins Cancer Research Endowment	3,000	G
4/11/11	WVU	Grace C. Clements Speech Pathology and Audiology Research Endowment	12,280	G
4/26/11	MU	Chemistry Summer Undergraduate Research Endowed Professorship	60,444	G
4/26/11	MU	Brickstreet Endowment for Safety Engineering	100,000	G
5/10/11	MU	Shelba Pew Endowment for River Research	115,100	G
5/10/11	MU	Marshall Institute for Interdisciplinary Research	365,100	G
5/11/11	MU	Isabelle D. and Lloyd F. Zacharias OB/GYN Research Endowment	398,357	G
5/18/11	WVU	Schoepp Neuroscience Research Student Sport Fund	5,000	G
5/27/11	MU	Anonymous Translational Sports Medicine Research Endowment	5,000,000	P
6/10/11	WVU	James P. Boland, M.D., Department of Surgery Endowed Research Fund	-	G
6/13/11	WVU	Morrissey-Ropp Scholarship	74,631	G
6/13/11	WVU	David VanDorn Sutton Scholarship	400,584	G
6/13/11	WVU	James and Betty Hall Fellowship	100,000	P
6/13/11	WVU	Robert and Stephany Ruffolo School of Pharmacy Graduate Fellowship	50,000	G
6/13/11	WVU	Van Wyk Cancer Research Endowment	25,000	G
6/13/11	WVU	West Virginia United Health System Evidence-Based Nursing Practice Research Endowment	42,500	G
6/13/11	WVU	Mike Ross Family Pediatric Diabetes Research Endowment	400,000	P
6/13/11	WVU	Stuart M. and Joyce N. Robbins Distinguished Professorship in Epidemiology	1,000,000	P

Date	Recipient	Fund	Amount	Pledge/Gift
6/13/11	WVU	Gary and Lisa Christopher Graduate Fellowship	125,000	P
6/13/11	WVU	Raymond Brooks Vanscoy Cancer Research Endowment	8,516	G
6/13/11	WVU	Grace C. Clements Speech Pathology and Audiology Research Endowment	250	G
6/13/11	WVU	Badzek Family Endowment for Nursing Research	100	G
6/13/11	WVU	James A. Kent Endowment for Biomedical Engineering	4,000	G
6/13/11	WVU	Norma Mae Huggins Cancer Research Endowment	7,725	G
6/13/11	WVU	Rita Radcliff-Deppe and Brian Deppe Fellowship Award	15,000	G
6/13/11	WVU	James P. Boland, M.D., Department of Surgery Endowed Research Fund	19,699	G
9/8/11	MU	Chemistry Undergraduate Research Experience Endowment	11,987	G
9/8/11	MU	Pew Endowments for River Research	100,000	G
9/9/11	MU	Marshall Institute for Interdisciplinary Research	754,000	G
9/29/11	WVU	Raymond Brooks Vanscoy Cancer Research Endowment	8,516	G
9/29/11	WVU	J.F. Brick Chair in Neurology	1,500,000	G
9/29/11	WVU	Women in Science and Engineer Giving Circle Endowment	18,000	G
9/29/11	WVU	Martha Hopkins Hashinger Research Scholarship	26,855	G
9/29/11	WVU	Academy of Chemical Engineers Graduate Fellowship	129,250	G
9/29/11	WVU	Arch Coal Inc. Endowment for Mine Health and Safety Research	300,000	P
9/29/11	WVU	Jarrett Family Research Endowment for Dentistry	100,000	G
9/29/11	WVU	Donald R. and Linda E. Holcomb Research Endowment for Dentistry	100,000	P
9/29/11	WVU	Mabel C. Phares Leukemia Research Endowment	350,000	G
9/29/11	WVU	Benjamin James Galford Research Scholarship	10,000	G
9/29/11	WVU	David VanDorn Sutton Scholarship	635	G
9/29/11	WVU	Wells Fargo Energy Group Scholarship	32,000	G
9/29/11	WVU	James P. Boland, M.D., Department of Surgery Endowed Research Fund	5,005	G
9/29/11	WVU	James A. Kent Endowment for Biomedical Engineering	6,000	G
9/29/11	WVU	The Michael Baker Corporation Endowment In Civil and Environmental Engineering	50,000	P
9/29/11	WVU	Grace C. Clements Speech Pathology and Audiology Research Endowment	100	G
9/29/11	WVU	Badzek Family Endowment for Nursing Research	50	G
9/29/11	WVU	Branson-Maddrell Endowed Professorship in Orthodontics	124,134	P
9/29/11	WVU	Allen S. Pack Endowment for Mining Engineering	1,500	G
9/29/11	WVU	Walter H. Moran, Jr., General Surgery Resident Research Endowment	25,000	G
9/29/11	WVU	Norma Mae Huggins Cancer Research Endowment	104,420	G
10/17/11	WLSU	Bucks For Brains, 01-10-7700	32,130	G
10/28/11	MU	Chemistry Undergraduate Research Experience Endowment	11,987	G
10/28/11	MU	Marshall Institute for Interdisciplinary Research	754,000	G
10/28/11	MU	Pew Endowments for River Research	100,000	G
10/28/11	WVU	Allen S. Pack Endowment for Mining Engineering	1,500	G
10/28/11	WVU	Arch Coal Inc. Endowment for Mine Health and Safety Research	300,000	P
10/28/11	WVU	Badzek Family Endowment for Nursing Research	100	G
10/28/11	WVU	Badzek Family Endowment for Nursing Research	50	G
10/28/11	WVU	Benjamin James Galford Research Scholarship	10,000	G
10/28/11	WVU	Branson-Maddrell Endowed Professorship in Orthodontics	124,134	P
10/28/11	WVU	David VanDorn Sutton Scholarship	400,584	G
10/28/11	WVU	David VanDorn Sutton Scholarship	635	G
10/28/11	WVU	Donald R. and Linda E. Holcomb Research Endowment for Dentistry	100,000	P
10/28/11	WVU	Gary and Lisa Christopher Graduate Fellowship	125,000	P
10/28/11	WVU	Grace C. Clements Speech Pathology and Audiology Research Endowment	250	G
10/28/11	WVU	Grace C. Clements Speech Pathology and Audiology Research Endowment	100	G
10/28/11	WVU	J.F. Brick Chair in Neurology	1,500,000	G
10/28/11	WVU	James A. Kent Endowment for Biomedical Engineering	4,000	G
10/28/11	WVU	James A. Kent Endowment for Biomedical Engineering	6,000	G
10/28/11	WVU	James and Betty Hall Fellowship	100,000	P
10/28/11	WVU	Jarrett Family Research Endowment for Dentistry	100,000	G
10/28/11	WVU	Mabel C. Phares Leukemia Research Endowment	350,000	G
10/28/11	WVU	Martha Hopkins Hashinger Research Scholarship	26,855	G
10/28/11	WVU	Mike Ross Family Pediatric Diabetes Research Endowment	400,000	P
10/28/11	WVU	Morrissey-Ropp Scholarship	74,631	G

Date	Recipient	Fund	Amount	Pledge/Gift
10/28/11	WVU	Norma Mae Huggins Cancer Research Endowment	7,725	G
10/28/11	WVU	Norma Mae Huggins Cancer Research Endowment	104,420	G
10/28/11	WVU	Raymond Brooks Vanscoy Cancer Research Endowment	8,516	G
10/28/11	WVU	Raymond Brooks Vanscoy Cancer Research Endowment	8,516	G
10/28/11	WVU	Rita Radcliff-Deppe and Brian Deppe Fellowship Award	15,000	G
10/28/11	WVU	Stuart M. and Joyce N. Robbins Distinguished Professorship in Epidemiology	1,000,000	P
10/28/11	WVU	The Michael Baker Corporation Endowment In Civil and Environmental Engineering	50,000	P
10/28/11	WVU	Wells Fargo Energy Group Scholarship	32,000	G
10/28/11	WVU	West Virginia United Health System Evidence-Based Nursing Practice Research Endowment	42,500	G
11/16/11	SU	Undergraduate Research and Experiments in Research-Based Accomplishments for STEM	32,882	G
1/9/12	WVU	Academy of Chemical Engineers Graduate Fellowship	2,100	G
1/9/12	WVU	Branson-Maddrell Endowed Professorship in Orthodontics	20,000	G
1/9/12	WVU	Dr. Mohindar S. Seehra Research Award	25,000	G
1/9/12	WVU	Grace C. Clements Speech Pathology and Audiology Research Endowment	50	G
1/9/12	WVU	Mabel C. Phares Leukemia Research Endowment	49	G
1/9/12	WVU	Nesselroad Family Glaucoma Research Fund	70,000	P
1/9/12	WVU	Norma Mae Huggins Cancer Research Endowment	30,040	G
1/9/12	WVU	Oleg D. and Valentina P. Jefimenko Library Resources Fund #2	341,666	G
1/9/12	WVU	Oleg D. and Valentina P. Jefimenko Physics Fellowship	91,667	G
1/9/12	WVU	Oleg D. and Valentina P. Jefimenko Physics Scholarship	66,667	G
1/9/12	WVU	Raymond Brooks Vanscoy Cancer Research Endowment	8,516	G
1/9/12	WVU	Robert T. Bruhn Physics Research Endowment	52,603	G
1/9/12	WVU	Shaw Pathology Research Fund	50,000	G
1/23/12	WVU	Academy of Chemical Engineers Graduate Fellowship	5,500	G
1/23/12	WVU	Badzek Family Endowment for Nursing Research	150	G
1/23/12	WVU	Frank and Susan Klatskin Cerminara Endowment	10,000	G
1/23/12	WVU	Jack and Marietta Mullenger Fellowship	12,500	P
1/23/12	WVU	Mitchell-Morey Family Endowment	25,000	P
1/23/12	WVU	Norma Mae Huggins Cancer Research Endowment	30,850	G
1/23/12	WVU	Rita Radcliff-Deppe and Brian Deppe Fellowship Award	2,385	G
1/23/12	WVU	Virginia Oil and Gas Research Endowment for PNGE	10,000	G
1/23/12	WVU	WVU Ruby Scholars Graduate Research Fellowship	400,000	G
2/8/12	WVU	Statler Research Endowment	10,000,000	P
2/8/12	WVU	Statler Research Scholars Program	1,000,000	P
2/9/12	FSU	Fairmont State University Foundation	4,520	G
3/9/12	CU	Concord University Faculty-Student Research Program (CU-FSRP)	23,500	G
4/10/12	WVUSU	Acquisition of a 400 MHz NMR for West Virginia State University	100,000	G
4/10/12	WVU	Grace C. Clements Speech Pathology and Audiology Research Endowment	6	G
4/10/12	WVU	WVU School of Medicine Research Endowment Fund	370,860	G
7/3/12	FSU	Fairmont State University Foundation	3,202	G
7/3/12	FSU	Fairmont State University Foundation	3,043	G
10/10/12	MU	BrickStreet Endowment for Safety Engineering	100,000	G
10/10/12	MU	Chemistry Undergraduate Research Experience Endowment	26,410	G
10/10/12	MU	Donald Cain Tarter Biological Sciences Student Research Scholarship Endowment	27,660	G
10/10/12	MU	Herbert L. Eiselstein Memorial Scholarship	16,300	G
10/10/12	MU	J.H. Fletcher and Company Endowment for Research in Mechanical Engineering	721,798	G
10/10/12	MU	Marshall Institute for Interdisciplinary Research	1,164,078	G
10/10/12	MU	Rahall Transportation Institute	25,000	G
10/10/12	MU	Translational Sports Medicine Endowment	50,000	P
10/11/12	MU	Steve and Mary Beckelheimer Science Education Graduate Scholarship Endowment	50,000	P
10/23/12	SU	Undergraduate Research and Experiments in Research-Based Accomplishments for STEM	20,312	G
<b>Total Number of Requests</b>			<b>165</b>	
<b>Total Funds Requested as of November 30, 2012</b>			<b>42,863,322</b>	
<b>Total Number of Pledges</b>			<b>29</b>	
<b>Total Funds Pledged</b>			<b>21,780,768</b>	
<b>Total Number of Gifts</b>			<b>136</b>	
<b>Total Funds Gifted</b>			<b>21,082,554</b>	

**Research Trust Fund - Principal**

Combined Total Distributions to Date (11/26/2012) Opening Balance \$50,000,000 June 2008

Doc ID	Item	FY	Date	Amount	Balance
I1009524271	Marshall University Research Corp	2009	3/4/2009	-50,000.00	49,950,000.00
I009524237	Marshall University Research Corp	2009	3/4/2009	-415,000.00	49,535,000.00
I009977397	WVU Foundation	2010	7/17/2009	-918,453.00	48,616,547.00
I009977805	WVU Foundation	2010	7/17/2009	-737,575.00	47,878,972.00
I010174294	WVU Foundation	2010	10/29/2009	-1,149,672.00	46,729,300.00
I010264902	Marshall University Research Corp	2010	12/11/2009	-277,100.00	46,452,200.00
I010279363	WVU Foundation	2010	12/17/2009	-683,533.00	45,768,667.00
I010564851	WVU Foundation	2010	2/19/2010	-105,246.00	45,663,421.00
I010846617	WVU Foundation	2010	4/7/2010	-2,335,355.00	43,328,066.00
I011046825	WVU Foundation	2010	6/8/2010	-206,583.00	43,121,483.00
I01199357	WVU Foundation	2010	6/28/2010	-536,300.00	42,585,183.00
I011173548	WVU Foundation	2011	7/26/2010	-1,136,862.00	41,448,321.00
I011319765	WVU Foundation	2011	10/14/2010	-221,505.00	41,226,816.00
I011412479	WVU Foundation	2011	12/13/2010	-406,317.00	40,820,499.00
I011447361	WVU Foundation	2011	1/4/2011	-88,201.00	40,732,298.00
I011495630	Marshall University Research Corp	2011	2/1/2011	-114,646.00	40,617,652.00
I011495637	Marshall University Research Corp	2011	2/1/2011	-125,000.00	40,492,652.00
I011495616	Marshall University Research Corp	2011	2/1/2011	-1,000,000.00	39,492,652.00
I011495626	Marshall University Research Corp	2011	2/1/2011	-50,000.00	39,442,652.00
I011921416	WVU Foundation	2011	3/30/2011	-7,534,286.00	31,908,366.00
I012185490	Marshall University Research Corp	2011	5/19/2011	-60,444.00	31,847,922.00
I012185489	Marshall University Research Corp	2011	5/19/2011	-100,000.00	31,747,922.00
I012185488	Marshall University Research Corp	2011	5/19/2011	-115,100.00	31,632,822.00
I012185487	Marshall University Research Corp	2011	5/19/2011	-365,100.00	31,267,722.00
I012185491	Marshall University Research Corp	2011	5/19/2011	-398,356.93	30,869,365.07
I012210159	WVU Foundation	2011	5/31/2011	-641,906.00	30,227,459.07
I012235425	Marshall University Research Corp	2011	6/6/2011	-5,000,000.00	25,227,459.07
I012332831	WVU Foundation	2012	7/26/2011	-2,273,005.00	22,954,454.07
I012513399	Marshall University Research Corp	2012	10/26/2011	-4,000.00	22,950,454.07
I012513396	Marshall University Research Corp	2012	10/26/2011	-11,987.00	22,938,467.07
I012513342	Marshall University Research Corp	2012	10/26/2011	-100,000.00	22,838,467.07
I012513406	Marshall University Research Corp	2012	10/26/2011	-750,000.00	22,088,467.07
I1012513131	WVU Foundation	2012	10/26/2011	-2,891,465.00	19,197,002.07
I012596509	WVU Foundation	2012	12/7/2011	-1,166,000.00	18,031,002.07
I012678992	WVU Foundation	2012	1/25/2012	-571,870.00	17,459,132.07
I012863413	WVU Foundation	2012	2/17/2012	-11,000,000.00	6,459,132.07
I013114557	WVU Foundation	2012	4/9/2012	-395,866.00	6,063,266.07
I013683440	Marshall University Research Corp	2013	10/16/2012	-16,300.00	6,046,966.07
I013683234	Marshall University Research Corp	2013	10/16/2012	-25,000.00	6,021,966.07
I013683236	Marshall University Research Corp	2013	10/16/2012	-26,410.00	5,995,556.07
I013683450	Marshall University Research Corp	2013	10/16/2012	-27,660.00	5,967,896.07
I013683379	Marshall University Research Corp	2013	10/16/2012	-50,000.00	5,917,896.07
I013683239	Marshall University Research Corp	2013	10/16/2012	-100,000.00	5,817,896.07
I013683244	Marshall University Research Corp	2013	10/16/2012	-721,797.62	5,096,098.45
I013683237	Marshall University Research Corp	2013	10/16/2012	-1,164,077.50	3,932,020.95
I013696068	Marshall University Research Corp	2013	10/16/2012	-50,000.00	3,882,020.95
<b>Total Draws on Principal/Balance</b>				<b>-46,117,979.05</b>	<b>\$ 3,882,020.95</b>

**Research Trust Fund - Principal**  
**MARSHALL UNIVERSITY**

Total Distributions to Date (11/26/2012)

Opening Balance \$15,000,000 June 2008

Doc ID	Item	FY	Date	Amount	Balance
I009524271	Marshall University Research Corp	2009	3/4/2009	-50,000.00	14,950,000.00
I009524237	Marshall University Research Corp	2009	3/4/2009	-415,000.00	14,535,000.00
I010264902	Marshall University Research Corp	2010	12/11/2009	-277,100.00	14,257,900.00
I011495630	Marshall University Research Corp	2011	2/1/2011	-114,646.00	14,143,254.00
I011495637	Marshall University Research Corp	2011	2/1/2011	-125,000.00	14,018,254.00
I011495616	Marshall University Research Corp	2011	2/1/2011	-1,000,000.00	13,018,254.00
I011495626	Marshall University Research Corp	2011	2/1/2011	-50,000.00	12,968,254.00
I012185490	Marshall University Research Corp	2011	5/19/2011	-60,444.00	12,907,810.00
I012185489	Marshall University Research Corp	2011	5/19/2011	-100,000.00	12,807,810.00
I012185488	Marshall University Research Corp	2011	5/19/2011	-115,100.00	12,692,710.00
I012185487	Marshall University Research Corp	2011	5/19/2011	-365,100.00	12,327,610.00
I012185491	Marshall University Research Corp	2011	5/19/2011	-398,356.93	11,929,253.07
I012235425	Marshall University Research Corp	2011	6/6/2011	-5,000,000.00	6,929,253.07
I012513399	Marshall University Research Corp	2012	10/26/2011	-4,000.00	6,925,253.07
I012513396	Marshall University Research Corp	2012	10/26/2011	-11,987.00	6,913,266.07
I012513342	Marshall University Research Corp	2012	10/26/2011	-100,000.00	6,813,266.07
I012513406	Marshall University Research Corp	2012	10/26/2011	-750,000.00	6,063,266.07
I013683440	Marshall University Research Corp	2013	10/16/2012	-16,300.00	6,046,966.07
I013683234	Marshall University Research Corp	2013	10/16/2012	-25,000.00	6,021,966.07
I013683236	Marshall University Research Corp	2013	10/16/2012	-26,410.00	5,995,556.07
I013683450	Marshall University Research Corp	2013	10/16/2012	-27,660.00	5,967,896.07
I013683379	Marshall University Research Corp	2013	10/16/2012	-50,000.00	5,917,896.07
I013683239	Marshall University Research Corp	2013	10/16/2012	-100,000.00	5,817,896.07
I013683244	Marshall University Research Corp	2013	10/16/2012	-721,797.62	5,096,098.45
I013683237	Marshall University Research Corp	2013	10/16/2012	-1,164,077.50	3,932,020.95
I013696068	Marshall University Research Corp	2013	10/16/2012	-50,000.00	3,882,020.95
<b>Total Draws/Balance</b>				<b>-11,117,979.05</b>	<b>\$ 3,882,020.95</b>

**WEST VIRGINIA UNIVERSITY**

I009977397	WVU Foundation	2010	7/17/2009	-918,453.00	34,081,547.00
I009977805	WVU Foundation	2010	7/17/2009	-737,575.00	33,343,972.00
I010174294	WVU Foundation	2010	10/29/2009	-1,149,672.00	32,194,300.00
I010279363	WVU Foundation	2010	12/17/2009	-683,533.00	31,510,767.00
I010564851	WVU Foundation	2010	2/19/2010	-105,246.00	31,405,521.00
I010846617	WVU Foundation	2010	4/7/2010	-2,335,355.00	29,070,166.00
I011046825	WVU Foundation	2010	6/8/2010	-206,583.00	28,863,583.00
I01199357	WVU Foundation	2010	6/28/2010	-536,300.00	28,327,283.00
I011173548	WVU Foundation	2011	7/26/2010	-1,136,862.00	27,190,421.00
I011319765	WVU Foundation	2011	10/14/2010	-221,505.00	26,968,916.00
I011412479	WVU Foundation	2011	12/13/2010	-406,317.00	26,562,599.00
I011447361	WVU Foundation	2011	1/4/2011	-88,201.00	26,474,398.00
I011921416	WVU Foundation	2011	3/30/2011	-7,534,286.00	18,940,112.00
I012210159	WVU Foundation	2011	5/31/2011	-641,906.00	18,298,206.00
I012332831	WVU Foundation	2012	7/26/2011	-2,273,005.00	16,025,201.00
I012513131	WVU Foundation	2012	10/26/2011	-2,891,465.00	13,133,736.00
I012596509	WVU Foundation	2012	12/7/2011	-1,166,000.00	11,967,736.00
I012678992	WVU Foundation	2012	1/25/2012	-571,870.00	11,395,866.00
I012863413	WVU Foundation	2012	2/17/2012	-11,000,000.00	395,866.00
I013114557	WVU Foundation	2012	4/9/2012	-395,866.00	0.00
<b>Total Draws/Balance</b>				<b>-35,000,000.00</b>	<b>\$ -</b>

**Research Trust Fund - Investment Earnings**

Balance to Date (11/26/2012)

Doc ID	Item	FY	Date	Amount	Balance
B000158553	Deposit	2008	6/23/2008	72,848.46	72,848.46
B000159850	Deposit	2009	7/23/2008	95,111.68	167,960.14
B000161742	Deposit	2009	8/27/2008	103,432.45	271,392.59
B000162754	Deposit	2009	9/26/2008	106,361.79	377,754.38
B000164313	Deposit	2009	10/28/2008	97,418.28	475,172.66
B000165684	Deposit	2009	11/26/2008	86,642.71	561,815.37
B000166737	Deposit	2009	12/29/2008	56,745.14	618,560.51
B000168129	Deposit	2009	1/29/2009	49,224.83	667,785.34
B000169146	Deposit	2009	2/25/2009	29,732.46	697,517.80
B000170549	Deposit	2009	3/31/2009	16,969.35	714,487.15
B000171926	Deposit	2009	4/27/2009	11,943.43	726,430.58
B000172631	Deposit	2009	5/14/2009	8,019.46	734,450.04
B000174613	Deposit	2009	6/23/2009	16,106.39	750,556.43
B000176131	Deposit	2010	7/31/2009	12,239.93	762,796.36
B000177787	Deposit	2010	8/28/2009	8,877.13	771,673.49
B000178739	Deposit	2010	9/21/2009	5,997.91	777,671.40
I010147485	Reviewer	2010	10/7/2009	-472.00	777,199.40
B000180651	Deposit	2010	10/30/2009	4,826.35	782,025.75
B000181939	Deposit	2010	11/30/2009	3,716.87	785,742.62
B000183168	Deposit	2010	12/30/2009	3,731.29	789,473.91
B000184592	Deposit	2010	1/28/2010	6,187.79	795,661.70
B000185766	Deposit	2010	2/25/2010	5,311.82	800,973.52
B000186801	Deposit	2010	3/19/2010	4,278.76	805,252.28
B000188288	Deposit	2010	4/28/2010	4,852.94	810,105.22
B000189864	Deposit	2010	5/26/2010	5,466.22	815,571.44
B000190758	Deposit	2010	6/16/2010	6,663.01	822,234.45
B000192457	Deposit	2011	7/28/2010	7,179.78	829,414.23
B000194204	Deposit	2011	8/27/2010	7,897.86	837,312.09
B000194905	Deposit	2011	9/13/2010	7,705.42	845,017.51
B000196953	Deposit	2011	10/26/2010	7,171.41	852,188.92
B000198343	Deposit	2011	11/22/2010	7,095.96	859,284.88
B000199686	Deposit	2011	12/23/2010	6,633.55	865,918.43
B000201114	Deposit	2011	1/28/2011	6,501.96	872,420.39
E000884801	Shepherd University	2011	2/4/2011	-39,306.75	833,113.64
E000886016	Fairmont State University	2011	2/16/2011	-9,250.00	823,863.64
B000202542	Deposit	2011	2/23/2011	6,487.16	830,350.80
B000204010	Deposit	2011	3/28/2011	5,674.09	836,024.89
B000204922	Deposit	2011	4/18/2011	5,509.04	841,533.93
B000206964	Deposit	2011	5/27/2011	4,475.10	846,009.03
B000208025	Deposit	2011	6/16/2011	3,266.60	849,275.63
B000209527	Deposit	2012	7/19/2011	2,326.78	851,602.41
B000211019	Deposit	2012	8/23/2011	2,082.00	853,684.41
B000212617	Deposit	2012	9/29/2011	1,922.95	855,607.36
B000214083	Deposit	2012	10/25/2011	2,021.20	857,628.56
I012577135	West Liberty Foundation	2012	11/28/2011	-32,130.00	825,498.56
E000923421	Shepherd University	2012	11/30/2011	-32,881.75	792,616.81
E000932533	Fairmont State University	2012	2/16/2012	-4,520.00	788,096.81
E000932532	Fairmont State University	2012	2/18/2012	-8,450.00	779,646.81
E000934759	Concord University	2012	3/2/2012	-23,500.00	756,146.81

Doc ID	Item	FY	Date	Amount	Balance
B000214923	Deposit	2012	11/17/2011	1,807.63	757,954.44
B000216055	Deposit	2012	12/20/2011	1,635.60	759,590.04
B000217441	Deposit	2012	1/18/2012	1,619.85	761,209.89
B000218701	Deposit	2012	2/21/2012	1,498.29	762,708.18
B000220284	Deposit	2012	3/29/2012	969.77	763,677.95
E00940946	WVSU	2012	4/19/2012	-100,000.00	663,677.95
B000221780	Deposit	2012	4/23/2012	710.46	664,388.41
B000223096	Deposit	2012	5/21/2012	642.72	665,031.13
E000941272	Fairmont State University	2012	4/24/2012	-1,000.00	664,031.13
B000224613	Deposit	2012	6/15/2012	682.57	661,511.62
E000952211	Fairmont State University	2013	7/19/2012	-3,202.08	660,829.05
B000225792	Deposit	2013	7/23/2012	679.38	662,191.00
B000226911	Deposit	2013	8/16/2012	663.54	662,854.54
B000229005	Deposit	2013	9/21/2012	740.05	663,594.59
B000229945	Deposit	2013	10/22/2012	844.51	664,439.10
PENDING	Shepherd University	2013	11/26/2012	-20,311.50	644,127.60
<b>Cash Balance</b>					<b>\$ 644,127.60</b>
Commitments				-225,340.42	439,690.71
Administrative Fees FY '09- FY '12				-187,377.00	\$ 252,313.71
<b>Unobligated Balance</b>					<b>\$ 252,313.71</b>

Commitments	Budget	Draws	Balance
Shepherd	99,892.50	-92,500.00	7,392.50
Fairmont	100,000.00	-26,422.08	73,577.92
West Liberty	100,000.00	-32,130.00	67,870.00
Concord	100,000.00	-23,500.00	76,500.00
WVSU	100,000.00	-100,000.00	0.00
<b>Total Awards</b>	<b>499,892.50</b>	<b>-274,552.08</b>	<b>225,340.42</b>

# REPORT ON THE WEST VIRGINIA RESEARCH TRUST FUND

## West Virginia University<sup>1</sup>

August 15, 2012

### A Landmark Achievement

A total of \$35 million in matching funds through the Research Trust Fund was available to West Virginia University. The University is pleased to report that \$35 million in private endowments that qualified for the matching funds are now established. This landmark achievement is a testament to our donors and their belief in and support of the research mission of the University.

### Introduction

This fourth annual report describes the activities and achievements for 2011-2012 regarding WVU's Strategic Research Plan relative to the State of West Virginia's Research Trust Fund initiative. This document also responds directly to the reporting requirements outlined in Series 48 (§ 133-48-14).

In addition, an update on the Eminent Scholars Recruitment and Enhancement Program is included.

### Eminent Scholars Recruitment and Enhancement Program (2007-2008)

The predecessor to the Research Trust Fund was the Eminent Scholars Recruitment and Enhancement (ESRA) Program. Under this program, WVU successfully matched the available \$5 million commitment from the State for a total investment of \$10 million to enhance its research and outreach efforts in the areas of cancer and stroke. These initiatives directly enhance WVU's efforts to respond to patient needs in two critical areas of health care. The continuing development of each initiative is reviewed below.

### CANCER PROJECT

To recruit and retain eminent scholars in the areas of breast cancer, lung cancer and gynecological cancer:

1. The Jo and Ben Statler Chair and Eminent Scholar in Breast Cancer Research, Fund 3V805 - \$1.5 million
2. The Bonnie Wells Wilson Distinguished Professor and Eminent Scholar in Breast Cancer Research, Fund 3V804 - \$1 million
3. ESRE Program Matching Funds - \$2.5 million

### Fund Purpose Statements:

\$1.5 million from Ben and Jo Statler will support a Chair in Breast Cancer Research to benefit the Mary Babb Randolph Cancer Center (MBRCC), West Virginia University. The Fund's spend is designated to be used annually by the MBRCC to support the Chair, including salary and/or fringe benefits, teaching/research assistants, travel expenses, conference attendance, secretarial and other support staff, and to otherwise support the scholarly activities of a regionally, nationally or internationally recognized outstanding scholar in the field of breast cancer research.

\$1 million from Ben and Jo Statler will support a Distinguished Professorship to benefit the Mary Babb Randolph Cancer Center, West Virginia University. The Fund's spend shall be used annually by the MBRCC to support the Distinguished Professorship, including salary and/or fringe benefits, teaching/research assistants, travel expenses, conference attendance, secretarial and other support staff, and to otherwise support the scholarly activities of a regionally, nationally or internationally recognized outstanding scholar in the field of cancer research.

\$2.5 million from ESRE will support the recruitment and start-up of three physician-scientists in the area of lung, breast and gynecological cancers to conduct Phase I and II clinical trials.

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<sup>1</sup> Address questions and requests for additional information regarding the Eminent Scholars Recruitment and Enhancement Program to Dr. Glenn Dillon, Vice President for Health Sciences Research and Graduate Education, West Virginia University Health Sciences Center (ghdillon@hsc.wvu.edu); for additional information regarding WVU's Strategic Research Plan and the Research Trust Fund initiative to Dr. Michele Wheatly, Provost, West Virginia University (michele.wheatly@mail.wvu.edu) or Dr. Fred King, Interim Vice President for Research, West Virginia University (fred.king@mail.wvu.edu).

## Funding Impact:

The impact of this support to grow the research portfolio of the Cancer Center has been significant. It is precisely the type of investment that is needed to prepare a Cancer Center Support Grant (CCSG) application to establish the first NCI-designated Cancer Center in West Virginia. Three research and clinical faculty have been recruited to the MBRCC under this plan as outlined in prior progress reports: Michael Ruppert (MD, PhD) from the University of Alabama–Birmingham, Breast Cancer Research Program; Jame Abraham (MD) from WVU, Breast Cancer Research Program; and William Tse (MD) from the University of Colorado, Osborn Hematopoietic Malignancies and Transplantation Program. Progress over this past year has been significant and there are prospects to link activities to opportunities provided through the WV Research Trust Fund as well. The Cancer Center would welcome another opportunity for scientific recruitment under this mechanism to move the Center closer to a NCI-designation.

Activities this past year are summarized below:

- **Erik Bey, PhD** – Dr. Bey was jointly recruited to the institution this past year from UT-Southwestern in Dallas as Assistant Professor of Basic Pharmaceutical Science in the School of Pharmacy and Eminent Scholar in Lung Cancer Research at MBRCC. He is an expert in oxidative stress pathways, with emphasis on NQO1-directed quinine therapies. Eminent Scholar funds were committed for laboratory start-up for this junior scientist. As a minority hire, Dr. Bey also fulfills a commitment to enhance faculty diversity.
- **Associate Center Director for Translational Research** – The MBRCC is in the midst of its final leadership recruitment, which commenced in August 2009. Since then 14 candidates were formally interviewed and three were extended offers. An offer is currently extended to Xue-Zhong Yu (MD, MS), who is a senior physician scientist from the H. Lee Moffitt Cancer Center and Research Institute in Tampa, Florida. He has three NIH R01 grants and expertise in graft vs. host disease and will be enormously helpful to grow the translational research platforms in the Osborn Hematopoietic Malignancy and Transplantation Program. It is anticipated that this recruitment will come to fruition shortly after submission of this report. Eminent Scholar funds as well as an endowed chair – Chambers Chair in Hematological Malignancies Research – with matching funds from the WV Research Trust Fund are directed toward his recruitment.
- **Alternative Strategy for Associate Center Director for Clinical Research** – The MBRCC has been unable to attract a viable candidate for this position. The MBRCC senior leadership has re-dedicated efforts to recruit a clinician scientist as Co-Leader of the Sara Crile Allen and James Frederick Allen Lung Cancer Program in the MBRCC. This recruit will join Yon Rojanasakul (PhD), Professor of Basic Pharmaceutical Science, who is a NIH-funded investigator with interest in lung cancer, and was named Co-Leader in January 2012. Eminent Scholar funds will be directed toward this recruitment; one candidate has already visited campus and several others are in process.

Questions and/or requests for additional information should be directed to Dr. Scot Remick ([scot.remick@hsc.wvu.edu](mailto:scot.remick@hsc.wvu.edu)), Director, Mary Babb Randolph Cancer Center.

## STROKE PROJECT

To recruit eminent scholars to enhance new interventions to prevent and treat stroke and enhance recovery of brain function:

1. West Virginia University Hospital (WVUH) Private Gift, Fund 2R338 - \$2.5 million
2. ESRE Program Matching Funds - \$2.5 million

### Fund Purpose Statements:

\$1.5 million from WVUH will support the recruitment of a Stroke Medical Director. This person will be a clinician-scientist with board certification in stroke neurology who will bring extensive experience with stroke clinical trials and the ability to design new trials based upon research at WVU and other research institutions.

\$1.0 million from WVUH will support the recruitment of a clinician-scientist with board certification in stroke neurology and neuro-intensive care. S/he will bring experience in the design and conduct of clinical trials and the necessary credentials to classify the WVU clinical stroke unit as a comprehensive stroke center.

\$1.5 million from the ESRE Program will support recruitment of a Stroke Translational and Basic Science Research Director. This person will be a clinician-scientist with credentials as both a stroke neurologist and laboratory-based scientist. S/he will guide a research team investigating biological mechanisms that underlie stroke events, new diagnostics of stroke, the neuro-vascular response to stroke and neural repair.

\$1.0 million from ESRE will support the recruitment of an expert in regenerative medicine who uses stem cells or other means to regenerate neurons and neural circuits. This person will develop therapeutic approaches that will be tested in clinical trials.

## **Funding Impact:**

This fund is providing resources to the support development of the Stroke Research Program. Last year a Stroke Neurologist, Christopher Cummings (MD) who did stroke fellowship at the Cleveland Clinic, was hired. A Stroke Clinical Research Nurse was added this year. They are working with and providing support to Dr. Laurie Gutmann, Stroke Medical Director. Through her leadership, Ruby Memorial Hospital, the WVU School of Medicine and the WVU Health Sciences Center have collaborated to create the new WVU Stroke Center. The Center provides a multidisciplinary and comprehensive approach to stroke. An emergency response team is available 24 hours a day to evaluate and treat stroke patients quickly to help minimize lasting damage. Treatment teams include experts in neurology, neurosurgery, interventional radiology, emergency medicine, neuro-imaging, physical therapy and others who collaborate on care for and rehabilitation of patients. This collaborative approach is extremely effective and our current mortality statistics are low compared to national data. The number of patients treated through the Stroke Center increased by 8% over the past year. In addition, the last two years have seen an increase in stroke research trials, with 12 ongoing clinical studies, five of which are funded by NIH.

The WVU Stroke Center outreach efforts involve making West Virginians aware of the warning signs of stroke and working with providers and first responders throughout the state to ensure standards of care. Research groups are working to develop new strategies for treatment, including new diagnostic and therapeutic approaches, as well as monitoring the effectiveness of new therapies. Five of the National Institutes of Health (NIH) stroke clinical trials are currently active in the Center. The Stroke Center was also recognized by the NIH as the "role model" for a rural comprehensive stroke program. For the last two years, the Center's program has received the Get With the Guidelines-Stroke Gold Plus Achievement Award by the American Heart Association/American Stroke Association and Target Stroke Award. The Center's transient ischemic attack (TIA) mortality is extremely small compared to many peer institutions. The mortality and length of stay for TIA, as well as for ischemic and hemorrhagic stroke, are all substantially lower than established norms for peer American academic medical centers. Only 6% of America's hospitals meet WVU's door-to-needle time.

Associated with growth of the clinical program, investments have been made into infrastructure and faculty recruitment in basic and translational stroke research. This segment of the stroke research team is coalesced into a new laboratory space on the first floor of a new research building, the Erma Byrd Biomedical Research Facility (BMRF). The build-out of the first floor was completed in January 2011, at a cost of approximately \$8 million. Therefore, WVU continues to invest substantial resources into this program. Currently six stroke research faculty occupy contiguous space in the BMRF. The laboratories of additional faculty recruited with support from ESRE funds will also be housed here. The search for the Stroke Translational and Basic Sciences Director is complete and negotiations are ongoing with the top candidate.

ESRE funds have been used to recruit new stroke researchers to WVUHSC. Taura Barr (RN, PhD) is a clinician/scientist who studies genetic predictors of stroke events and outcome. Additionally, Valeriya Gritsenko (PhD) and Sergiy Yakovenko (PhD) are new Assistant Professors who study brain motor systems. They are specifically interested in motor system reorganization following stroke, and development of rehabilitation strategies to improve recovery of motor function following a stroke.

Questions and/or requests for additional information should be directed to Dr. Laurie Gutmann (lagutmann@hsc.wvu.edu), Director, WVU Stroke Center.

## **Research Trust Fund (2008-2009)**

In March 2008, the West Virginia Legislature enacted Senate Bill 287, commonly referred to as the Research Trust Fund, as an effort to build a critical mass in selected areas of research and thus lay the groundwork for future economic development. The initial Bill provided a five year window for the deposit of qualified donations into its research endowments. Senate Bill 239 (Passed March 12, 2011) amended §18B-18A-9 of the Code of West Virginia to provide a seven year window. Senate Bill 287 committed \$35 million to West Virginia University as a basis for a 1:1 match for private dollars to create endowments that would provide a sustainable source of funds for research and development. West Virginia University's approved Strategic Research Plan identified four areas for investment:

- Energy and environmental sciences
- Nanotechnology and material science
- Biological, biotechnological, and biomedical sciences
- Biometrics, security, sensing and related identification technologies

A brief description of each research area is available at

**[http://research.wvu.edu/home/research\\_trust\\_of\\_west\\_virginia\\_university](http://research.wvu.edu/home/research_trust_of_west_virginia_university)**

These areas build on the expertise of WVU's faculty, are critical issues of importance to the public, and are at the core of WVU's land-grant mission.

An Addendum to WVU's Strategic Research Plan for the Research Trust Fund was approved by the WVU Board of Governors in December 2010 and incorporated therein. Three modifications were made:

1. Adding forensic sciences as an area of emphasis under the biometrics, security, sensing, and related identification technologies, providing the opportunity for private investment into this area of research.
2. Adding a Library endowment to support the acquisition of materials in the four research areas, clarifying the importance that library resources provide to a vibrant research agenda.
3. Removing the language "no research area may receive more than \$17.5 million in private donations within the first two years," allowing WVU to maximize private investment regardless of focus area.

## **Efforts Over 2010-2011**

### **WVU's Commitment to Research Development**

West Virginia University continues to balance its tripartite responsibilities for teaching, research, and service in fulfillment of its land-grant mission. The institution is in the second full year of its comprehensive strategic plan, WVU's 2020 Strategic Plan for the Future (<http://strategicplan.wvu.edu>). "To excel in research, creative activity and innovation" is one overarching objective of the strategic plan.

Dr. Fred King, Professor of Chemistry and Associate Dean for Research in the Eberly College of Arts and Sciences, has been appointed as WVU's Interim Dean for Research, replacing Dr. Curt Peterson who retired in December 2011. Dr. King is currently reviewing the structure and function of the Research Office with an eye toward the future. In light of the significant stresses in the national economy and attendant changes in the research environment, namely the moratorium on directed funding, loss of ARRA funding, reductions in industry sponsorship, reductions in non-research grants, increasing competition for available federal funds, and potential cuts to future research agency budgets, Dr. King is also revisiting the research expectations called for in the WVU 2020 Strategic Plan.

The impact of the changing national research environment is readily reflected in the marked reduction of \$51 million in total funding for sponsored programs at WVU in FY12, specifically from \$173.9 million in FY11 to \$122.9 million in FY12. Thirty-five million is attributed to the loss of ARRA and congressionally directed funding. This reduction comes as WVU faculty submitted just over 100 more proposals in FY12 compared to FY11. The decline in proposal success, and funding, reflects the extremely competitive nature of the federal research grant process. In addition to the 21 new faculty positions in research focal areas related to the Research Trust Fund (including 12 in energy and the environment, two (2) in nanotechnology, six (6) in biological sciences and one (1) in biometrics/forensics) authorized by the Office of the Provost for FY12, 20 additional positions have been approved for Fy13, including another ten (10) related to energy and three (3) related to addressing health disparities. The other seven (7) positions are dedicated to innovations in water stewardship, radio astronomy, and STEM education. Thus WVU continues to support faculty growth in areas related to the Research Trust Fund.

As noted last year, the WVU's Board of Governors approved a new Advanced Engineering Research Building; ground breaking is scheduled for the fall 2012 semester. A new Agricultural Sciences Building for the Davis College of Agriculture, Natural Resources and Design continues through the design phase. Construction has also begun on a new biomedical research building. These new facilities, with new state-of-the-art research laboratories, directly support WVU's aggressive research agenda.

Through new hires, support for their start-up needs, and major capital investments into the research infrastructure, WVU continues to make tangible commitments to its research agenda.

### **Energy and environmental sciences.**

In 2011-2012, two elements of the "Business Plan for the Advanced Energy Institute (AEI)" aimed at improving WVU's competitive position were implemented: 1) sponsoring (via internal funding) teambuilding for emerging interdisciplinary initiatives, and 2) strengthening capabilities in energy policy research. A competition for the AEI funding was held and two teambuilding initiatives were selected for funding over a two year period. Both are truly interdisciplinary and involve researchers from the Statler College of Engineering and Mineral Resources, the Davis College of Agriculture, Natural Resources and Design, and the Eberly College of Arts and Sciences. One initiative is focused on bio-energy and the other on geothermal resource development. Likewise, a competition for AEI funding to support energy policy research concluded with the funding of two initiatives focused on Marcellus Shale policy issues. These four initiatives have been monitored via quarterly project reviews and each is proceeding as planned. Sponsorship of these initiatives has already strengthened WVU's competitive position and proposals for several new grant opportunities have been submitted.

Total funding awarded for energy research in FY12 was below the \$30.9 million received in FY11. The decline was due primarily to the reduction in federal funding for energy research, the de-emphasis of fossil energy research, and the elimination of congressional earmarks. As a result, the steady growth in energy research funding that began with FY09 ceased.

The AEI web site, [www.energyresearch.wvu.edu](http://www.energyresearch.wvu.edu), is updated frequently and provides news and information about AEI and contains articles about recent achievements of faculty and researchers. A few of the highlights of WVU's work in the energy and environmental sciences follow:

- The NETL-RUA (National Energy Technology Laboratory-Regional University Alliance) selected two (out of six considered) Strategic Growth Areas for further development: the Grid Technologies Collaboration (GTC) and the Critical Materials Alliance (CMA). Each will receive modest funding through FY13. WVU is involved as a team member for both of these Strategic Growth Areas and AEI has been working to support significant roles for WVU faculty in each. There is an immediate and major opportunity for the CMA as DOE has released a Funding Opportunity Announcement (FOA) for a Hub focused on Critical Materials. The potential funding for this Hub is in the \$125 to \$140 million range over a five year period. The overall CMA program is being led by Virginia Tech and the Hub proposal is due in August 2012.
- WVU officials signed a technology management plan with Chinese officials on August 19, 2011. This plan is a key document that governs the research performed by the U.S.-China Clean Coal Energy Research Center led by WVU Professor Jerald Fletcher. The U.S. and Chinese groups each include a consortium of universities, national laboratories and private sector companies. These consortia are researching ways to make coal more environmentally friendly. A major element of the technology management plan is an agreement for the protection of intellectual property when information is shared. Under the agreement, an inventing entity can set the terms for the license and can limit the property's use or receive royalties.
- WVU's focus on innovation and the commercialization of technologies discovered by its researchers is receiving key support from the Claude Worthington Benedum Foundation. In August 2011, the Foundation awarded the university a \$132,000 grant to improve commercialization and economic impact by nurturing ties to industries and to other universities that are recognized for successful entrepreneurial efforts. Research faculty, administrators and students are being engaged and exposed to new avenues and resources that help move technologies to the marketplace. The initiative is called Linking Innovation, Industry and Commercialization or LIINC.
- On September 16, 2011, WVU's Statler College of Engineering and Mineral Resources announced that it will receive \$1.5 million over the next five years as part of the U.S. Department of Energy's Industrial Assessment Center program. The grant, a renewal of a program that has been at WVU since 1992, places emphasis on students gaining practical training on core energy efficiency and management concepts. The grant requires the Statler College to train 10-15 students a year in conducting energy assessments as well as extensive follow-up reporting and tracking.
- WVU experts are working on a new generation of affordable, high capacity electric storage batteries that could help keep a busy nation's lights shining brightly even in the aftermath of crippling weather events like the storm that violently knocked out power to millions of Americans in July 2012. An experienced research team led by Dr. Xingbo Liu and composed of experts from a range of WVU colleges is set to explore that possibility and develop the technology to make it a reality under a major new initiative called the Center for Electrochemical Energy Storage or CEES. The initiative has received a \$1.3 million Research Challenge Grant from the West Virginia Higher Education Policy Commission's Division of Science and Research.
- WVU's College of Law will expand its energy curriculum by adding six new energy law courses during the 2012-2013 academic year. Professor Joshua Fershee, a former practitioner in the energy industry and member of the faculty at the University of North Dakota, has recently joined WVU's Law faculty. The expanded energy curriculum further enhances the College's Center for Energy and Sustainable Development.
- In October 2011, the West Virginia University College of Law held a two-day conference to look at critical issues related to Marcellus shale gas development. "Drilling Down on Regulatory Challenges: Balancing Preservation and Profitability in the Development of Shale Gas Resources" examined the economic potential and the regulatory conundrums faced by state lawmakers in protecting the economy and the environment. The event focused on key topics facing public and private policy makers and featured more than a dozen experts on aspects of the development of shale gas resources. The event presented points of view from across the spectrum through talks by industry experts, regulators, policy makers, representatives of environmental groups and concerned citizens.
- Two software grants were provided to WVU for energy research:
  1. A division of Halliburton has donated \$10.2 million worth of software to Eberly College's Department of Geology and Geography to help with its energy research and teaching mission. The gift was made by Landmark Software & Services, a leading supplier of software to the oil and gas industry.
  2. Siemens has given the Statler College of Engineering and Mineral Resources product lifecycle management software (by Siemens PLM), an in-kind gift valued at more than \$425 million. This donation will offer WVU students the opportunity to gain hands-on experience with the same software used by leading companies around the world.

- In August 2011, the new training center developed to teach personnel how to operate clean integrated gasification combined cycle (IGCC) power plants formally opened at WVU's National Research Center for Coal and Energy. Established as part of DOE's initiative to advance new clean coal technology for power generation, the goal of the facility is to train the workforce needed to operate future IGCC power plants. AVESTAR will also allow students to navigate a power plant that uses clean coal technology using 3D glasses and a joy stick controller. The center will foster training, research and education activities in the area of advanced fossil energy power generation.
- West Virginia University engineering professors Brian J. Anderson and Shahab D. Mohaghegh recently earned high achievement awards from U.S. Department of Energy Secretary Steven Chu. The two were recognized for their efforts with the National Energy Technology Laboratory (NETL) in response to the Deepwater Horizon oil spill. The NETL team was recognized for estimating the rate of oil flowing into the Gulf of Mexico, and also for developing options to cap the well. This work led to effective analyses of raw data, which guided

### **Nanotechnology and material science.**

There is a continued effort to advance nanoscale science, engineering, education and medicine across the state of West Virginia through interdisciplinary research. Interdisciplinary research on West Virginia University's campuses involve over 40 faculty members from five colleges and twelve departments at WVU.

WVU is entering the second year of a \$20 million, five-year National Science Foundation Research Infrastructure Improvement (RII) grant on nano-enabled technology for sensors with focus on enhancing public security and environmental safety. This important initiative builds interdisciplinary projects across science, engineering and medicine to address problems of national need. Faculty who are engaged in this program have formed a group called WVU NanoSAFE, the state of West Virginia's initiative for nanoscale science, engineering and education.

The research activities of this cooperative agreement require sustainable computational capabilities. Due to this requirement, the infrastructure of a High Performance Computing facility (HPC) has been supported through this grant. The HPC provides computational capabilities that are an important consideration for nano device development. By the end of the second year, 384 computing cores have been purchased and installed. At least fifteen WVU researchers used the facility during the past year.

Education and outreach are components of the NSF RII grant. During the last year, there were events held to provide outreach about nanotechnology to our community including participation in the Morgantown Arts Walk and Kids' Day. Artistic scanning electron and atomic force microscopy images were displayed at the Morgantown History Museum as part of the Arts Walk. The exhibit was entitled, "Imaging the Invisible" and visitors were exposed to the science of how nanoscale images are captured and interpreted. A booth was set up for visitors during the Morgantown Kids' Day in July 2012 to learn about nanoscience using materials from the NISE Network. Approximately 100 adults and children passed through and participated in the activities.

The WVU Shared Research Facilities (SRF), an outcome of the NSF RII grant, offers access to highly specialized, state of the art instruments located in several locations on the Downtown and Evansdale campuses. The SRF provides students, postdoctoral researchers and faculty the opportunity to use 35 cutting edge instruments located in one of four facilities: an electron microscopy facility, a materials fabrication and characterization laboratory, a cleanroom, and a bio-nano research facility. The bio-nano facility enables research at the intersection of molecular biology and nanomaterials. The four facilities are managed by PhD scientists and engineers who have a commitment to train and prepare students for their future endeavors in industry or academia. During FY12, there were over 100 users of the facilities including several users external to the University.

### **Biological, biotechnological, and biomedical sciences.**

The Health Sciences Center interdisciplinary research programs are focused upon health disparities relevant to West Virginia and Appalachia. Biomedical research focuses on discovery and understanding of new treatment strategies that translate into improvements in health and well-being.

For example, in cancer cell biology, the National Center for Research Resources designated WVU as a Center of Biomedical Research Excellence (COBRE) in cancer biology. WVU programs for cancer patients – including clinical trials of the latest drugs, radiological and surgical treatments – are directly tied to laboratory research. WVU is also the home of an NIH-designated COBRE in sensory neurosciences which supports our efforts to address the clinically important area of neurological diseases such as stroke.

In cardiovascular sciences and vascular biology, WVU has a full array of researchers in the basic sciences, in clinical care, and in risk prevention and health promotion working together to address some of West Virginia's most pressing health issues.

A major commitment to research has led to impressive institutional growth. Externally funded research awards have grown over the past decade, and the Health Sciences faculty has been particularly successful in competing for federal funding. A new 22,000-square-foot

biomedical research facility, funded primarily from a National Institutes of Health grant, is currently under construction. Additional recent facility improvements include the new four-story, 118,000-square foot Erma Byrd Biomedical Research Center and renovated research space in the WVU Pediatric Research Institute.

Some current research highlights from the past year include:

- The emerging School of Public Health (SPH) was established in June 2012. Interim Dean Alan Ducatman, M.D., and his faculty have submitted accreditation materials to the Council on Education for Public Health and have been approved for the next accreditation step. SPH faculty have recently received notification of several new competitive NIH grants. Topics of research include developing a computational framework for clinical decision making, environmental exposures and coronary artery disease, and effectiveness of cell phone laws in reducing traffic accidents in young drivers.
- Dr. David Felton, D.D.S., was recruited as the new Dean of the School of Dentistry. Dr. Felton joined us from University of North Carolina at Chapel Hill. He has initiated searches to recruit several dental clinician-scientists who will conduct clinical and translational research that addresses dental needs of West Virginia.
- Dr. Deborah Shelton, Ph.D., R.N., was recruited as the E. Jane Martin Professor and Associate Dean for Research and PhD Education. Dr. Shelton is Principal Investigator on grants from NIH and HRSA totaling over \$3 million; these awards focus on improving nurse competencies and engagement in research.

### **Biometrics, security, sensing and related identification technologies.**

The research activities in biometrics, security and sensing continue as area of excellence for West Virginia University nationally and internationally. The core research activity revolves around the Center for Identification Technology Research - CITeR ([www.citer.wvu.edu](http://www.citer.wvu.edu)), a National Science Foundation sponsored Industry – University Cooperative Research Center. The center celebrated its 10th year anniversary this past year with an impressive inventory of achievements, which included over 300 academic publications and six textbooks authored by participating faculty. In the 2011 National Biometrics Challenge document prepared by the National Science and Technology Council, part of the Executive Office of the President, CITeR is the only academic organization mentioned by name and credited for the contributions to biometrics research in the United States. Formed at West Virginia University, CITeR has recently expanded with sites at the University of Arizona, Clarkson University and the University of Buffalo.

Research activities related to biometrics, security and sensing technology have continued to grow as the result of the professional relationships with its industry and government partners. WVU continues to serve as the academic lead for the FBI Biometric Center of Excellence. During the past year, research project awards in the Center of Excellence to WVU faculty exceeded \$3.4 million. WVU continues its partnership with the University of Arizona and a dozen other academic organizations nationwide in the DHS Center of Excellence in Border Security and Immigration. Faculty and students continue their research projects sponsored by the Office of Naval Research (\$1.1million and \$0.7 million), the Department of Justice (\$3 million) and the National Science Foundation. CITeR has made significant progress towards stimulating economic development in the region through its Transition Readiness Assessment Center supported by the National Institute of Justice (\$1.1 million).

WVU recently hired two new faculty members with expertise in biometric security. The Research Trust Fund Endowment “Verizon WV for Biometrics” is now providing additional support for their start-up packages, primarily by sponsoring the research of gifted students. This approach emphasizes the integration of educational and research programs in biometrics with the growing emphasis on West Virginia workforce development.

## **Achieving the Goal: \$70 million in Private and State Endowments**

Over the four year period since the inception of the Research Trust Fund, West Virginia University created 86 private endowments. These 86 endowments totaled \$35 million, the total amount allocated to the University through the Research Trust Fund initiative. Each endowment was qualified by the West Virginia University Board of Governors and thus eligible for state matching funds. Thus the University’s goal was achieved. Through the combined support of private donors and the state legislature, WVU has established \$70 million in endowments to support research. These endowments include five generic types of gifts: 12 chairs and professorships, 14 undergraduate scholarships, 15 graduate fellowships, 43 broad-based research support funds, and 2 library endowments.

## **Compliance with Legislative Rule for Research Trust Fund**

Three specific reporting requirements are identified in Series 48 (§ 133-48-14), the Research Trust Fund Program.

**14.1.** By August 15, 2009, and annually thereafter, each participating institution shall provide an annual report to the Commission that includes a full accounting of the trust funds, endowment proceeds, and adherence to the objectives established by the research

plan shall provide an annual report to the Commission that includes a full accounting of the trust funds, endowment proceeds, and adherence to the objectives established by the research plan.

**14.2.** Each participating institution shall detail in its annual report to the Commission the total amount of qualified donations received, the investment earnings realized and any anticipated expenditures of the research endowment proceeds in its annual operating budget.

The data in APPENDIX A summarize much of the information requested by the Legislative Rule.

Through June 30, 2012 the following results have been achieved:

• **FY12 Market Value for all the Private RTF Endowments**

The market value of Directed Research Endowments established with private gifts invested in the Research Trust Fund Program of the WVU Foundation Endowment for fiscal year ending June 30, 2012 is \$25,687,574.

• **FY13 Spend Available for the open Private RTF Endowments**

The available proceeds from Directed Research Endowments established with private gifts invested in the Research Trust Fund Program of the WVU Foundation Endowment for FY13 are \$904,037.

• **FY12 Market Value for all the State RTF Endowments**

The market value of Directed Research Endowments established with trust distributions (state funds) to the Research Trust Fund Program of the WVU Foundation Endowment for fiscal year ending June 30, 2012 is \$34,639,059.

• **FY13 Spend Available for the Open State RTF Endowments**

The available proceeds from Directed Research Endowments established with trust distributions to the Research Trust Fund Program of the WVU Foundation Endowment for FY13 are \$69,376.

• **FY12 Total Number and Amount of Gifts Received that Qualified for State Funds**

During FY12, the WVU Foundation received 335 qualified private gifts (donations and pledges) totaling \$16,025,201; matching funds equal to this amount were requested from the Research Trust Fund.

• **FY12 Total Number and Amount of Gifts Received from the State for Matching Funds**

During FY12, the WVU Foundation received six (6) distributions from the state's Research Trust Fund of \$18,298,206 to match 454 qualified gifts (donations and pledges) to Directed Research Endowments.

• **Total Number and Amount of Gifts Received since Inception that Qualified for a State Match**

During the period from March 08, 2008 to June 30, 2012, the WVU Foundation received 1210 qualified private gifts (donations and pledges) totaling \$35,000,000; matching funds equal to this amount were requested from the Research Trust Fund.

• **Total Number and Amount of Gifts Received since Inception from the State for Matching Funds**

During the period from March 08, 2008 to June 30, 2012, the WVU Foundation received 19 distributions from the Research Trust Fund totaling \$35,000,000 to match 1210 qualified gifts (donations and pledges) to Directed Research Endowments.

3. **14.4.** Each participating institution's research corporation and/or foundation shall provide the Commission with an audited financial statement annually. These statements shall be treated as confidential.

A copy of the audited financial statements for years ending June 30, 2011 and 2010 for the WVU Foundation has been forwarded to the Policy Commission through Chancellor Hill under separate cover. Because of timing of submission of this report relative to the receipt of the audited financial statement, the audited financial statement of the WVU Foundation, Inc. will always be a year in arrears.

## **Examples of the Impact of the Research Trust Fund Initiative**

In last year's report, three gifts were described to illustrate the impact of the Research Trust Fund initiative.

1. The first two Ruby Graduate Fellows were recruited; both are West Virginians and each received a three-year \$30,000 per year fellowship plus a tuition and fee waiver from West Virginia University. The Ruby Fellowships are the most prestigious graduate fellowships at WVU. At least two additional fellowships are anticipated this coming year. These fellowships provide a life-changing opportunity for these students.
2. Dr. William Neal continues to serve as the James H. Walker Chair of Pediatric Cardiology and continues to make a difference in the lives of the youth of West Virginia and their families.
3. The George B. Bennett Dean's Research Opportunity Fund provided support for start-up support for new faculty in CEMR. This source of flexible funds is critical for helping new faculty begin their research careers.

This past year, as part of the gift that led to the naming of the Statler College of Engineering and Mineral Resources, \$11 million of the donation qualified for matching funds from the Research Trust Fund. This endowment, when matched with state Trust Fund dollars, will provide scholarships and research support for at least 20 meritorious undergraduate students in engineering, thus easing their financial burden to attend West Virginia University and enriching their education through a research experience. This gift also supports three endowed named chairs in energy research and an accompanying graduate fellowship program. This gift will help the university lead the nation in energy research and engineering.

The impact of the Research Trust Fund is evident in this small sampling of the 86 different endowments that were created. In recognition of the successful completion of the challenge issued to the West Virginia University, President Clements has stated, "I want to thank our donors for their incredible support over the past few years. Through their generosity, in tough economic times, WVU has built a strong foundation of support for projects that directly help the State, as well as provide opportunities for undergraduate and graduate students to participate in world-class research with the highest caliber faculty and research staff at WVU. I also want to thank all of the State and University leaders who made the program possible. Our University, and West Virginia, is a better, stronger place because of their efforts." President Clements' statement captures the power of the Research Trust Fund initiative.

## Additional Reporting from West Virginia University

### Marketing Plans

West Virginia University continues to highlight through public news releases, stories on its home page and that of the WVU Foundation, stories in college and university brochures, and ceremonial activities the receipt of each gift and its potential impact. These actions readily demonstrate the impact of a gift on changing the lives of students and faculty who receive an honor or recognition or the impact to WVU's future as a 21st century leader in research that changes the lives of our citizens.

While the University has met its goal, inquiries continue to come from other donors regarding the potential to make a gift that would be matched with dollars from the Research Trust Fund. West Virginia University would welcome the inclusion of additional funds into the Research Trust Fund by the West Virginia Legislature. The ability to leverage state funds, on a dollar-for-dollar basis, makes the Trust Fund an attractive option for private donors. At the same time, private gifts provide the state with a way to double its limited resources and have a direct impact on economic development, job growth and health care.

### Grants and Contracts

Faculty at WVU were successful in obtaining \$69.1 million in external grants and contracts in 2011-12 in the four research areas identified within WVU's Strategic Research Plan (Table 1). As noted previously, the overall institutional funding level was down from that reported last year and is a reflection of the economic changes occurring nationally in support of research. This downward trend in external funding for research is occurring across higher education. Nonetheless, WVU remains committed to building a strong research agenda as reflected in the commitment to hire another 20 new faculty in STEM areas, 10 of which are in the energy area. Faculty are the foundation for a strong research enterprise. The four areas of WVU's Research Strategic Plan for the Research Trust Fund continue to be areas of focus in the future and thus will benefit from the endowments established through the Research Trust Fund.

### Partnership with the WVU Foundation

The WVU Foundation is a significant partner in the University's efforts to meet the goal established by the Trust Fund and is to be publicly recognized for its efforts. Foundation personnel work directly with the senior leadership within WVU to cultivate donors and guide the solicitation of each gift. The Foundation plays a critical role in the management of the private and state endowment funds.

All state matching endowments have been for the same purpose as the gift outlined in the private endowment.

**TABLE 1. Summary of the Funding Received by WVU through External Grants and Contracts in each Research Area for the Past Four Years.**

	Total Amount Awarded (million)			
	FY09	FY10	FY11	FY12
Energy and the environment	\$21.2	\$28.3	\$30.9	\$19.9
Nanotechnology and material Sciences	\$ 3.9	\$ 2.8	\$ 7.4	\$ 6.0
Biomedical sciences	\$49.0	\$69.5	\$57.4	\$38.7
Biometrics, security and Identification technologies	\$ 3.4	\$ 7.8	\$ 5.3	\$ 4.5
<b>TOTAL</b>	<b>\$77.5</b>	<b>\$108.4</b>	<b>\$101.0</b>	<b>\$69.1</b>

\*Includes renewals and new awards

## **Business Plan**

In addition to the legislatively mandated reporting requirements, the Higher Education Policy Commission required a business plan for each research area. APPENDIX A reflects the anticipated use of the money available to spend in FY13.

In FY12, \$289,492 of Research Trust Fund dollars, both that from private accounts and the matching state accounts, was spent on research – for scholarships, fellowships, prominent scholars, and in support of ongoing research initiatives. For FY13, \$,819,861 will be available. This number includes the proceeds from each private endowment and its equivalent state matching endowment plus any unspent money from the preceding year. Of this amount, \$318,788 (17.5%) will come from the matching state endowments established from the Research Trust Fund. It is important to note that the proceeds from an individual endowment, whether established by private or state funds, depend on the amount in the endowment, the length of time since the endowment was created, and the investment policies which differ between the private and state funds. Endowments without any spend for FY13 have not earned interest because, most often, they were established late in the fiscal year. When the amount of available funds was insufficient to meet the objectives of the endowment, the money was allowed to accrue. The funds for each endowment are being distributed according to the intent of the respective endowment.

## **Concluding Remark**

The Research Trust Fund has made an impact on the research initiatives at West Virginia University. In four years, 86 endowments have been established, qualifying for the total \$35 million available in state matching funds in the Research Trust Fund.

The Research Trust Fund Program grew out of the strategic planning that began in 2005 with the development and release of Vision 2015, the West Virginia Strategic Plan for Science and Technology. Vision 2015 called for a significant investment in human and physical infrastructure in STEM related disciplines at the two research universities in the state. The Eminent Scholars Recruitment and Enhancement Program began the process of infusing state funds into building this infrastructure. WVU's Cancer Center and Stroke Center continue to become stronger because of the ESRE Program. WVU has made a commitment to adding new faculty in STEM disciplines and to its physical infrastructure through a new Advanced Engineering Research Building, and a new Agricultural Sciences Building and a new Animal Research Facility. The Research Trust Fund Program continues that visionary support and in FY13, \$1,8 million will be available to support the institution's research agenda. WVU looks forward to the significant and sustained impact that the ERSE and RTF programs will have on addressing some of the nation's most important issues in energy, health care and security.

REPORT ON THE  
WEST VIRGINIA  
**RESEARCH TRUST FUND**

**Marshall University**  
**Research Endowment Plan Annual Report**  
2011-2012

**Table of Contents**

I. The Marshall University Research Endowment Plan	22
II. Research Endowment Plan Fundraising Progress	23
A. Fundraising in Prior Years	23
B. Summary of Fundraising in FY 2012	23
C. Description of Existing Endowed Research Areas	24
III. ESRE Update	
A. Recruitment of Eminent Scholars	26
B. Progress at MIIR	26
Appendix One – Marshall University Research Endowment Plan Addendum	27

## I. Review of the Marshall University Research Endowment Plan

The West Virginia Research Trust Fund program has led to the initiation of eleven endowments at Marshall University to fund allowed research-related activity. These endowments span research areas from Engineering to Clinical and Translational Research and uses from direct research support to student research stipends. Over \$9MM in gifts and pledges has been received, which will provide over \$18 MM in total endowments when matched by the state.

Marshall's original Research Endowment Plan approved by the University's Board of Governors in 2008, directed donations to:

- Endowment of the Marshall Institute for Interdisciplinary Research (MIIR), continuing with the plan laid out in Marshall's application to the Eminent Scholars Recruitment and Enhancement (ESRE) initiative; and
- Advancement of Intelligent Transportation Systems research at the Rahall Transportation Institute (RTI).

Both of these endowments continued to receive significant support in FY2012.

In November 2010, the Marshall University Board of Governors approved a Research Trust Fund Addendum (Appendix One) that broadened the recognition of Biomedicine/ Biotechnology as a focus for donor activity across the University, and further included aspects of Engineering, Environmental Science and the Physical Sciences.

The rationale for this expansion of the plan was based on the success of the Research Trust Fund program in the initial two areas and its potential to further accelerate other strategic research initiatives at Marshall. For example:

**Engineering:** With the accreditation of Marshall's engineering program, the potential for development of significant research activity has been enhanced by the construction of The Arthur Weisberg Family Engineering Laboratory facility and this trend will continue with the planned construction of the Biotechnology Incubator and Applied Engineering Complex. The availability of the Research Trust Fund will enhance the Engineering College's ability to attract and sustain research activity in key disciplines crucial to practical development of technology and innovation, and this, in turn will leverage the multidisciplinary research environment called for in Marshall University's Strategic Initiatives<sup>2</sup>.

The Fletcher Endowment in Mechanical Engineering and the BrickStreet Endowment in Safety Engineering were two significant gifts in this area.

**Clinical and Translational Research:** There has been substantial growth in biomedical research in the School of Medicine and at the Marshall Institute for Interdisciplinary Research, and new facilities developed to promote translation of basic science discoveries to improvements in patient care with the construction of the Translational Genomics facility at the School of Medicine. Based on these investments from ESRE, RTF and other sources, Marshall was a successful co-applicant on the University of Kentucky's Clinical and Translational Science Award from the National Institutes of Health program aimed at speeding the time for laboratory discoveries to benefit patients. This award makes Marshall a member of the Appalachian Translational Research Network, which involves not only UK but Ohio State, West Virginia University and Cincinnati Children's Hospital and makes resources available for further development of Marshall's clinical research effort. Marshall researchers are already accessing pilot funding, mentorship and collaborative opportunities from this partnership, and development of Research Trust Fund endowments to support clinical and translational research will allow Marshall to leverage this support.

The Maier Endowment for Dementia Research was the first gift in this area, and the appointment of Dr. Shirley Neitch as the inaugural of the Maier Clinical Research Professor was announced in June 2012. Subsequently, the Zacharias OB/GYN endowment, which has been directed to the support of the activities of Dr. David C. Jude, and the Cline Family Endowment for Translational Sports Medicine were established, indicating the substantial donor interest in this area.

Throughout FY 2012, the broadened scope of the Research Trust Fund Addendum provided the strategy for fundraising efforts, and no further modifications were deemed necessary.

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<sup>2</sup> <http://www.marshall.edu/President/strategic/initiatives.asp>

## II. Research Endowment Plan Fundraising Progress

### A. Fundraising in Prior Years (FY 2009, 2010 and 2011)

Through FY2009, 2010 and 2011, \$8.07MM in qualifying donations and pledges were received and matched for nine endowments.

### B. Summary of Fundraising in FY 2012

During FY 2012 four of the nine existing endowments received additional donations, indicating the willingness of donors to support the continued development of these programs (Table One). Both the MIIR endowment and the Chemistry Summer Undergraduate Research Endowment have broad support from a large number of individual contributors.

Both the MIIR endowment and the RTI endowment have benefitted from generous corporate support:

MIIR was the recipient of a \$750,000 gift from the AEP Foundation. Proceeds from this endowment will be used to support the Marshall Institute for Interdisciplinary Research and the institute's collaborations with other research initiatives at the university. The donation is the largest single gift ever made by the foundation in West Virginia.

Allied Realty made another \$100,000 gift to the MIIR endowment, bringing their total contribution to \$350,000 since the program's inception.

RTI continued to enjoy generous support from CSX for the transportation research endowment.

**Table One** - Fund Balances for Existing Research Trust Fund Endowments

Research Endowment	Fund Balance FY 2011	Fund Balance FY 2012	Locus
Marshall Institute for Interdisciplinary Research (MIIR)	\$1,200,000	\$2,064,923.50	Research Corporation
Rahall Transportation Institute (RTI)	\$100,000	\$150,000	Research Corporation
Pew River Research	\$115,000	\$215,000	College of Science
Chemistry Summer Undergraduate Research Endowment	\$72,431.00	\$93,661.00	College of Science

Total gifts and pledges since inception of the program came to over \$9MM at the end of FY 2012, with over \$1MM being raised during the year. Significant gifts and pledges are anticipated to bring the total funds raised to over \$10MM in the near future.

Earnings to date are \$120,767 on \$5.2MM of private gifts and pledges received, and \$328,000 on the \$8.066 MM of state match received.

Two new endowments for support of research-active undergraduates were created during FY2012, the Don C. Tarter Memorial Scholarship Endowment and the Eiselstein Memorial Scholarship Endowment (Table Two). Although relatively small initially, it is expected that these endowments will attract broad donor support in future years, akin to the pattern observed with the Chemistry Endowment. The utility of the Research Trust Fund in incentivizing and supporting undergraduate participation in research is further reinforced by these developments.

**Table Two** - Balances and Loci of New Research Trust Fund Endowments Created During FY 2012

Research Endowment	Donations as of 6/30/12	Locus
Tarter Biological Sciences Student Research Scholarship Endowment	\$27,660	Biology
Eiselstein Memorial Scholarship Endowment	\$16,000	Chemistry

These scholarships are dedicated as follows:

#### **The Herbert Louis Eiselstein Memorial Scholarship**

was established by his wife, Maryellen, in her husband's memory. Herbert spent his entire career with Inco Alloys International and retired as Vice President of Technology, Research and Development.

Freshman recipients of the support are to be full-time chemistry majors in the College of Science (COS) and have a minimum high school GPA of 2.9. Priority shall be given to students considering a career in metals and materials science or who have aspirations of becoming a professional scientist. The recipient shall engage in a minimum of 90 hours per semester of original student-faculty collaborative research.

#### **The Donald Cain Tarter Biological Sciences Student Research Scholarship**

Dr. Tarter received his Bachelors of Science in Biology and Chemistry from Georgetown College, his MAT in Zoology from Miami University, and his PhD in Zoology from the University of Louisville. His tenure from 1960 to 2001 at Marshall included six years as Chairperson for

the Department of Biological Sciences where he taught the courses -- Animal Ecology, Entomology, General Biology, Ichthyology, and Limnology. He was also the thesis director for 93 graduate students. Dr. Tarter's research interests were in the taxonomy/ecology of benthic macro invertebrates and fishes, and he was awarded over \$600,000 in grants and contracts in projects involving aquatic biology. He devoted his research energies to furthering understanding of the aquatic ecosystem and environmental disturbances which disrupt it.

Dr. Tarter authored or co-authored over 100 papers in aquatic biology in 11 journals, and presented over 100 papers at state and national meetings throughout the country. He served on the Environmental Quality Board in West Virginia for 12 years and was president of the West Virginia Academy of Science. Dr. Tarter was the honored recipient of the "Meet the Scholars" award at Marshall University in 1991.

The recipient shall be a full-time student (undergraduate of junior level or greater, or graduate), majoring in Biological Sciences or Integrated Sciences. The student must be involved in research in biological, biotechnical, biomedical sciences, or in energy and environmental sciences. The award shall be made just before or during the Fall semester of the academic year if possible. The Dean or appointed faculty members in the College of Science, in collaboration with the Office of Student Financial Aid, shall select the recipient(s) and renew the award as long as full-time status and good academic standing.

We include these dedications to show how these new endowments, coupled with the Chemistry fund, provide alumni and the community an opportunity to support undergraduate research, either to honor a distinguished mentor or scientist or as part of a general departmental initiative. The power of these programs in transmitting the success of a previous generation of scientists to the current generation of students is a very tangible output of the Research Trust Fund.

### **C. Description of Existing Endowed Research Areas**

The endowment plans for MIIR and RTI have been described in the original Research Trust Fund Plan and prior annual reports and MIIR activities are described more fully below. The brief descriptions of the other existing endowments are provided below to show the breadth of support the Research trust fund has engendered.

#### **Fletcher Mechanical Engineering Endowment**

Following the accreditation of the College of Engineering in the summer of 2010, the Board of Governors has endorsed development of new areas of emphasis in the engineering curriculum. Mechanical Engineering is a high priority, and the Fletcher family's generous gift will support the position of a founding chair of the department of Mechanical Engineering.

#### **Pew Endowment for River Research**

The proceeds of the requested endowment will be used to support start-up and research operating expenses of the ESRE Aquatic Ecologist, described in Section IV-A in this report. It is anticipated that the endowment proceeds will be used to support the purchase and maintenance of research equipment, the purchase of research supplies, and/or the support of undergraduate and graduate research fellows who are working with the ESRE Aquatic Ecologist.

#### **Maier Endowment for Dementia Research**

The endowment will support the work of promising biomedical/clinical scientists in the Marshall University School of Medicine, engaged in translational dementia research. This research support will foster interdisciplinary research dedicated to investigating the cause(s) of dementia, improving the clinical management, treatment and therapeutic outcomes for present and future generations of people who are at-risk or already suffering with dementia with the goal of eventually preventing this debilitating brain condition.

Dr. Shirley M. Neitch, professor of internal medicine and chief of geriatrics at the Joan C. Edwards School of Medicine at Marshall University, has been named the inaugural Maier Clinical Research Professor.

The professorship will support interdisciplinary translational research investigating the causes, management and treatment of dementia, which will significantly impact the lives of persons with the disease.

The first goal is to complete a genetics study of a family whose affected members develop symptoms at a very young age, in their late 20's. The next step will be to pursue treatment options.

#### **BrickStreet Endowment for Safety Engineering Research**

The College of Information Technology and Engineering's Safety Engineering Research Program is undertaking an initiative to expand its activity in risk management research. Risk management is a highly interdisciplinary field that involves applying the principles of safety engineering and industrial hygiene and integrating them with economic and financial analysis.

This discipline is extremely important to the transportation and logistics and energy sectors. The BrickStreet endowment will support the development of research expertise in the school of engineering in the area of risk management, by promoting these highly interdisciplinary studies at the interface of management, engineering and applied mathematics.

### **The Endowment for Summer Undergraduate Research in Chemistry**

The endowment has been created by individual donations and departmental royalties set aside for this purpose. The proceeds will be used to support endowed rotating professorships and undergraduate summer research fellowships in Chemistry. These summer positions are a central component in the Department's long-term strategy to increase research output and obtain sustainable external funding. Each student selected will do an original, collaborative research project with a supervising faculty member.

### **Fred and Isabella Zacharias Endowment for Obstetrics and Gynecology Research**

Physicians of the Department of Obstetrics and Gynecology at the Joan C. Edwards School of Medicine are active in the investigation into improving the pregnancy outcomes of women with obesity, hypertension, and diabetes. Through the Maternal Hypertension Center, there is an ongoing database of pregnancies evaluated and managed through that center for over five years.

Funds from the Fred and Isabella Zacharias Endowment will be used to support the activities of Dr. David C. Jude in biomedical research. His research interests include:

- Identification of characteristics of hypertensive, diabetic, and obese women that increase their likelihood of having poor pregnancy outcomes and investigating the outcomes of the infants born to these mothers.
- Determining what pre-pregnancy and pregnancy related interventions may improve maternal health during pregnancy.
- Determining what interventions before and during pregnancy may impact the short and long term health of these women.

### **The Cline Endowment for Translational Sports Medicine Research**

The endowment will support the Translational Sports Medicine Research at Marshall University where comprehensive interdisciplinary research that translates to advances in human injury prevention, injury recovery and accelerated therapeutic outcomes will be conducted. The endowment proceeds will be used to initiate and develop a nationally-competitive research program that enhances human function and quality of life through discoveries, which protect human health and enhance injury repair, while advancing human performance capacity.

The development of a robust, interdisciplinary research program is envisioned in areas such as:

**Musculoskeletal and Ligament Health and Injury** - research studies that evaluate predictors of joint and muscle injury, innovative techniques for injury intervention and prevention and the efficacy of conventional and novel treatment practices.

**Biomechanics** - research studies that identify and ameliorate biomechanical risk factors that predispose individuals to musculoskeletal injury.

**Muscle Injury and Genomics** - research studies that identify mechanisms of skeletal muscle injury, preventative therapies and underlying genomic factors that predispose humans to injury or limit human performance capabilities.

**Comparative Orthobiologics** - research studies that examine and discover biologics [e.g., gene therapy, cellular therapy, protein therapy] and other techniques for advancing and accelerating the healing of musculoskeletal injuries while improving the durability of healed sites.

### III. ESRE Update

#### A-Recruitment of Eminent Scholars/Startup of Their Laboratory Operations

At the beginning of FY 2012, the search for the Eminent Scholar in the College of Science was initiated. This Eminent Scholar is to continue the creation of a strong research cluster in freshwater resources, particularly in the scientific focus areas of Energy and the Environment. Dr. Mindy Yeager Armstead, a nationally respected aquatic ecologist from the commercial sector was selected. Dr. Yeager Armstead is leading an interdisciplinary team of faculty members focused on research and economic development activities associated with West Virginia's extensive water and energy resources.

Dr. Yeager has immediately brought grant activity to her new laboratories. She is the recipient of a sub-award under the Appalachian Research Initiative for Environmental Science (ARIES) project. Her activities are being given additional support from the Pew River Research Endowment.



#### B-Progress at MIIR



Nanobiologist Dr. Jingwei Xie joined MIIR's senior scientific staff in January of 2011 as the Eminent Scholar Senior Scientist from Washington University in St. Louis.

Dr. Xie has developed an active program exploring the biomedical applications of nanofiber scaffolds. This basic research is having translational implications in development of techniques for tissue repair to alleviate a wide variety of conditions, including myocardial infarction, and in applications such as tendon repair and skin grafts.

MIIR has been an important part of the Clinical and Translational Science Award (CTSA) award from the NIH with the University of Kentucky. Dr. Xie is currently funded on a pilot award to investigate the use of nanofiber scaffolds in treating myocardial infarction.

Other major projects in Dr. Xie's laboratory include:

#### Development of Submicron Bioactive Glass Tubes for Bone Tissue Engineering

Fabrication of submicron bioactive glass tubes has been achieved by injecting heavy mineral oil and gel solution to the core and shell independently during coaxial electrospinning, followed by sintering to remove the heavy mineral oil and polymer. This approach is simple, versatile and robust. An in vitro bioactivity test indicates that the bioactive glass tubes had a faster induction of HCA-like mineral formation compared to solid fibers. Pre-osteoblastic cells showed a higher proliferation rate on submicron bioactive glass tubes than on PCL fibers. In addition, the model protein drug BSA was released from bioactive glass tubes for a longer period than was observed with the solid fibers. The bioactivity of released lysozyme from glass tubes can be as high as 90.9%. This novel class of bioactive glass could be promising for applications in bone tissue engineering and drug delivery.

#### Mussel Inspired Protein-mediated Surface Modification to Electrospun Fibers and Their Potential Biomedical Applications

The work demonstrates a simple and versatile approach to the surface modification of electrospun fibers with a controllable layer of polydopamine using in situ aqueous polymerization of dopamine. Results suggest that polydopamine-mediated surface modification to electrospun fibers could render a wide range of novel fiber materials with multiple uses in tissue engineering and controlled drug delivery applications.

The University is currently conducting a nationwide search to identify a permanent Director to continue the recruiting of MIIR scientists and the expansion of the research portfolio.

<sup>3</sup> For further information, please see: <http://www.marshall.edu/murc/marshall-research-institute-adds-expert-in-bone-growth-and-development/>

## Appendix One- Marshall University's Research Trust Fund Addendum

The University's directed research endowment plan has concentrated initially in two domains of interdisciplinary research, which are strengths at Marshall: research clusters in biomedicine/biotechnology/ bionanotechnology and transportation technology/logistics. Marshall's Research Trust Fund activities are to be expanded to include the following areas:

### I. Engineering

Engineering is a foundational discipline essential to the development and implementation of research in the approved areas in the Research Trust Fund legislation<sup>4</sup>. Marshall has recently achieved ABET accreditation of its engineering program, and has experienced dramatic facilities growth with the construction and occupation of The Arthur Weisberg Family Engineering Laboratories facility and is planning for the future addition of an Advanced Engineering and Technology Center Complex. Development of robust undergraduate and graduate programs and the associated integral research opportunities are essential to developing and enhancing the capabilities and profile of the school.

Match from the Research Trust Fund will be requested to enhance private donations for endowed professorships and other research-related positions and initiatives in all aspects of Engineering as they relate to the allowed subject areas of the Research Trust Fund Program and the associated uses allowed in the legislation.

Two examples of gifts that have been received in support of engineering endowments are included, and a third solicitation is discussed:

### II. Applied Research- Safety Engineering Program

Risk management is a highly specialized field that involves applying the principles of safety engineering and industrial hygiene and integrating them with economic and financial analysis. Marshall University will expand its Research Trust Fund Plan in this area important to transportation and logistics and energy to support an endowment in risk management research. The proposed endowment will support the development of research expertise in the school of engineering in the area of risk management, a highly interdisciplinary pursuit at the interface of management, engineering and applied mathematics.

The proposed applied research employs advanced risk management concepts and research to identify, trend, estimate and reduce workplace hazards in industry based in WV. The area will be supported by a \$100,000 endowment received from BrickStreet and the corresponding state match.

Risk management is of particular interest to the energy industry in our state because of the safety and economic risks associated with the extraction process. In energy, risk management research is essential to find new ways to:

- deal with its high element of monetary risk due to the uncertainty of the economic and regulatory outlook
- reduce the physical risk associated with extraction and development activities, and improve the safety of individual employee

In transportation and logistics research, risk management has become central to understanding many critical elements such as:

- the robustness and resilience of our transportation systems to interruptions due to system load, natural phenomena, and man-made disruptions
- the risks associated with transport of hazardous materials and the potential benefits of mitigation of those risks
- the robustness of logistics networks
- the risks associated with logistics and supply chain outsourcing

These benefits are of particular relevance to the state given current events, and are particular interests of the donor.

### A. Mechanical Engineering

Mechanical engineering applies the principles of physics and materials science for analysis, design, manufacturing, and maintenance of mechanical systems. Mechanical engineers use the core principles of mechanics, kinematics, thermodynamics, materials science, and structural analysis along with tools like computer-aided engineering and product lifecycle management to design and analyze items as diverse as manufacturing plants, industrial equipment and machinery, heating and cooling systems, motorized vehicles, aircraft, water craft, robotics, medical devices and more.

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<sup>4</sup> 4.3.1. Energy and environmental sciences;  
4.3.2. Nanotechnology and materials sciences;  
4.3.3. Biological, biotechnical and biomedical sciences;  
4.3.4. Transportation technology and logistics;  
4.3.5. Biometrics, security, sensing, and related identification technologies; and  
4.3.6. Gerontology.

The field has continually evolved to incorporate advancements in technology, and mechanical engineers today are pursuing developments in such fields as composites, mechatronics, and nanotechnology. Mechanical engineering overlaps with aerospace engineering, civil engineering, electrical engineering, and petroleum engineering to varying amounts.

A gift from the Fletcher family will endow a founding Chair of Mechanical Engineering. Mechanical Engineering is an important discipline in Bioengineering and energy sectors. This endowment is essential to developing a Department of Mechanical Engineering, by attracting a senior-level professor to Marshall, with his/her associated research programs.

Another area that is endorsed by the Board of Governors for planning and an active source of solicitation is:

## **B. Bioengineering**

In the translation of biomedical and biotechnology advances, bioengineering is a lynchpin in bridging the transition from academe to commercialization. Marshall University is planning to develop a Bioengineering Department contemporaneously with the construction of the Applied Technology and Engineering Complex. The development of the Department would follow a trajectory very similar to that of Mechanical Engineering, with the attraction of a founding research scientist/bioengineer.

“Biological engineering, biotechnological engineering or bioengineering (including biological systems engineering) is the application of engineering principles to address challenges in the life sciences, which include the fields of biology, ecology, and medicine. Biological engineering is a science based discipline founded upon the biological sciences in the same way that chemical engineering, electrical engineering, and mechanical engineering are based upon chemistry, electricity and magnetism, and statics, respectively”<sup>5</sup>.

“Biological Engineering can be differentiated from its roots of pure biology or classical engineering in the following way. Biological studies often follow a reductionist approach in viewing a system on its smallest possible scale, which naturally leads toward the development of tools such as functional genomics. Engineering approaches using classical design perspectives are constructionist, involving the building and research of new devices, approaches, and technologies from component concepts. Biological engineering utilizes both of these methods in concert relying on reductionist approaches to define the fundamental units, which are then commingled to generate something new”.

“Although engineered biological systems have been used to manipulate information, construct materials, process chemicals, produce energy, provide food, and help maintain or enhance human health and our environment, our ability to quickly and reliably engineer biological systems that behave as expected remains less well developed than our mastery over mechanical and electrical systems”<sup>7</sup>.

Given Marshall's research strengths in the biological and biomedical sciences and the emphasis of new initiatives, like the Marshall Institute for Interdisciplinary Research (MIIR), on translating key research findings into commercialization, the discipline of bioengineering sits at a nexus of opportunity for the University. It will be a critical element in fully developing the potential of Marshall's applied research enterprise and its translation to economic development.

## **II. Mathematics and the Physical Sciences**

Mathematics and the Physical Sciences are basic sciences that have relevance to all aspects of the allowed areas of the research trust fund legislation. Research Trust Fund match will be sought to enhance private donations supporting endowed professorships and other research-related positions and initiatives focusing on research in the allowed areas in these disciplines.

The first application will be for an endowed rotating professorship to promote an undergraduate summer research experience in Chemistry.

This match for the undergraduate research endowment is being requested under the Research Trust Fund because undergraduate summer research in Chemistry is relevant to so many of the legislatively enabled areas;

- Chemistry is one of the fundamental underpinnings of nanoscience because of the molecular nature of the discipline
- The Department of Chemistry at Marshall University has core groups in biochemistry/biotechnology and materials science.
- Faculty members also work on energy research and molecular energetics.

These summer positions are a central component in the Department's long-term strategy to increase research output and obtain sustainable external funding. Each student selected does an original, collaborative research project with a faculty member. The relevance to the Research Trust Fund is clear from the work of the two most recent awardees, Austi Sergent Roush (2009) and Tiffany Bell (2010), who worked with Drs. McCunn and Frost respectively. Austi assisted Dr. McCunn in her first summer at Marshall establishing her lab and generating the preliminary results essential to her obtaining her recent award from the Research Corporation. Tiffany Bell identified transiently palmitoylated proteins while working on Professor Frost's research project "Identifying Post-translational Protein Modifications via Mass Spectrometry".

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<sup>5</sup> Cuello J.C., “Engineering to biology and biology to engineering, The bi-directional connection between engineering and biology in biological engineering design”, *Int. J. Eng. Ed.*, 21,1-7 (2005).

<sup>6</sup> Riley MR, “Introducing Journal of Biological Engineering”, *Journal of Biological Engineering* 1, 1 (2007).

<sup>3</sup> Endy D, “Foundations for Engineering Biology”, *Nature*, 438, 449-4 (2005).

# REPORT ON THE WEST VIRGINIA RESEARCH TRUST FUND FOR STATE COLLEGES

**Concord University** was awarded \$100,000 to implement a Faculty-Student Research Program (CUFSRP); a formalized summer undergraduate research initiative for science and mathematics majors designed to stimulate the research atmosphere on campus. The initiative will solidify undergraduate STEM research as an area of distinction at Concord. The primary goal of the program is to connect student learning with faculty development. Anticipated program outcomes include the creation of vibrant student/faculty research communities, increased graduation rates for science and mathematics majors, an increase in academic performance in upper-division courses, and an increase in postgraduate educational activities in STEM fields. To date, Concord University has drawn down \$23,500.

**West Liberty University** is using its \$100,000 award to provide research stipends to biology students which will develop strong workforce skills and to purchase advanced equipment for biology labs. Stipends are awarded based on student merit, research interests, and placement availability in a competitive process. The advanced equipment will allow faculty to undertake new research, and also prepare students to enter the professional arena with knowledge and experience of the types of instrumentation available and the capabilities of said instrumentation in terms of research and potential advancement. To date, West Liberty University has drawn down \$32,130.

**Fairmont State University** received \$100,000 for the “New Media Assessment Project,” which will enable the university’s Open Source Intelligence Exchange to create a process that allows the university to capture large amounts of content from new media applications such as Twitter, social networking sites and discussion boards, and to consequently generate new knowledge about national security and law enforcement threats. Fairmont’s program is anticipated to enhance the university’s competitiveness with federal agencies, its status as a leader in quality STEM research, its ability to incubate entrepreneurial economic development, and the quality of instruction and advising provided to students. To date, Fairmont State University has drawn down \$26,422.

**Shepherd University** received \$99,892.50 to develop an “Undergraduate Research and Experiments in Robotics-Based Accomplishments for STEM Students” project. Through this robotics initiative, the university will seek to improve the recruitment and retention of STEM students and better prepare them for careers in robotics engineering and science. Robotics is an emerging multi-disciplinary STEM area that combines mechanical, electrical and computer engineering in the design and construction of robots to perform specific tasks, in addition to emphasizing mathematics and computer science. To date, Shepherd University has drawn down \$92,500.

**West Virginia State University** was awarded \$100,000 to purchase a 400 MHz Nuclear Magnetic Resonance Spectrometer (NMR) to help strengthen and expand the science, technology, and mathematics research capacity of WVSU. WVSU’s undergraduate, graduate, and research faculty in the Departments of Chemistry and Biology as well as in the WVSU’s Gus R. Douglas Land-Grant Institute will use the NMR to conduct their cross-disciplinary research pursuant to: 1) teaching and learning goals of the approved institutional STEM curriculum and 2) research objectives contained in the Institutional Research Plan. The NMR will permit previously on-going research to continue and allow for new experimentation by faculty and students. WVSU has drawn down its entire \$100,000 and has purchased the NMR.



Senate Bill No. 287

West Virginia Higher Education Policy Commission

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